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Servicescapes in Cruise Ship Design - Case xpTray Design Concept

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Master's thesis

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School of Economics

HELSINGIN KAUPPAKORKEAKOULU
Logistiikka ja palvelutalous

SERVICESCAPES IN CRUISE SHIP DESIGN

Case xpTray Design Concept

Pro gradu -tutkielma
Pekka Lampinen
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ABSTRACT

Managing customer experiences has been found an increasingly important practice over the past twenty years. Experiences describe how customers feel about any goods or services, being a way to define their implicit value. Services, in particular, are very engaging when consumed, which accentuates the importance of their surroundings. These servicescapes enable service operations and serve as stimuli themselves, influencing the experience.

The cruise industry is an example where customers are provided a comprehensive hedonic service aboard the ship. Cruise lines and shipbuilders strive to develop ships that can provide an attractive setting for individual services and experiences. This study is conducted on the premise of one such product development effort, called the xpTray. A multi-disciplinary team was formed to research and develop the concept of a cruise ship that differs substantially from conventional designs. The purpose of this thesis is to assess the value of the xpTray to the cruise line and passengers and to explore the best options.

Firstly, business models are researched in order to discover whether radical innovations are appropriate in the world of the cruise industry. The second research objective is to evaluate the impact of servicescapes: Previous research on customer experience management (CEM) is used as a theoretical basis for evaluating the best options and practices. Thirdly, the best practices are applied to the xpTray design concept in an effort to find out if it proves superior to competition. A product development project, the research works with uncertain information and uses many available methods of empirical research, also relying on ideation.

CEM research features several detailed focal points, which are found to have strong linkages in this thesis. It is concluded that servicescapes are a powerful tool for influencing experiences. More specifically, it is proposed that experiential services are created in touch points and managed with personalization. A framework of servicescapes is developed, and it is applicable across industries as a comprehensive tool.

The industry's business models lead to conclude that managerial cognition has reinforced a culture favoring sustaining innovation, where the xpTray is a way to convey ideas on improvement. The design improves on layout, design themes, service clues and touch points. Financial analysis tools indicate that modular multi-purpose spaces can improve the ship's internal rate of return by 9.8 percentage points, while service level is maintained with attention to detail in CEM.

Keywords: Customer experience management, Servicescapes, Business models, Cruise industry
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Palveluympäristöt risteilyaluksen suunnittelussa: xpTray-aluskonsepti

TIIVISTELMÄ

Asiakaskokemusten suunnittelun tärkeys on korostunut viimeisen 20 vuoden aikana. Kokemukset kuvastavat asiakkaiden tuntemuksia tavaroista ja palveluista, ja ne toimivat tapana määrittää näiden implisiittistä arvoa. Erityisesti palvelujen kuluttaminen on hyvin kokonaisvaltainen kokemus, mikä korostaa ympäristön tärkeyttä. Ns. palveluympäristöt vaikuttavat palveluoperaatioihin ja ovat itsekin ärsykkeitä vaikuttaen näin asiakaskokemuksiin.

Risteilyt ovat esimerkki hedonistisesta palvelusta, jossa asiakkaalle tarjotaan kokemuksia kokonaisvaltaisesti. Varustamot ja telakat pyrkivät kehittämään laivoja, jotka toimivat viehättävinä ympäristöinä yksittäisille palveluille ja kokemuksille. Tämä tutkimus perustuu xpTray-nimisen laivakonseptin kehitystyöhön, jota varten koottiin poikkitieteellinen ryhmä arvioimaan ja kehittämään tätä tavallisesta suuresti poikkeavaa alusmallia. Tämän tutkielman tarkoitus on arvioida konseptin arvoa varustamolle ja matkustajille sekä löytää yksityiskohdille parhaat vaihtoehdot.

Ensin tutkitaan liiketoimintamalleja tarkoituksena arvioida, sopiiko radikaali innovaatio risteilyalalle. Toinen tutkimustavoite on määrittää palveluympäristöjen vaikutus kokemuksiin: Aiempaa tutkimusta asiakaskokemuksista käytetään teoreettisena pohjana parhaiden käytäntöjen määrittelylle. Kolmanneksi nämä parhaat käytännöt sovelletaan xpTray-konseptiin tavoitteena todistaa sen kilpailukyky. Tutkimus on tuotekehitysprojekti, joten siinä joudutaan sietämään hyvin epävarmaa tietoa. Siinä käytetään useampia empiirisen tutkimuksen keinoja (esim. haastatteluja), ja se on myös hyvin riippuvainen ideointityöstä.

Asiakaskokemusten tutkimus koostuu useista yksityiskohtaisista painopisteistä, joilla todetaan tässä tutkimuksessa olevan useita yhtymäkohtia. Toisena johtopäätöksenä esitetään, että palveluympäristöt ovat vahva työkalu asiakaskokemusten suunnittelussa. Tarkemmin esitetään, että kokemuspainotteiset palvelut tuotetaan kosketuspisteissä ja niitä johdetaan personoinnin avulla. Tutkimuksessa kehitetään palveluympäristöille teoreettinen viitekehys, joka on sovellettavissa läpi toimialojen.

Toimialan liiketoimintamalleista tehdään johtopäätös, että johdon ymmärrys liiketoiminnasta vahvistaa asteittaista innovaatiota tukevaa kulttuuria, jonka suhteen xpTrayn konsepti on tapa tuoda esille uusia ideoita. Konseptissa on parannuksia koskien pohjapiirustusta, muotoiluteemoja, palvelusta kertovia vihjeitä sekä kosketuspisteitä. Taloudellisen analyysin työkalut viittaavat siihen, että modulaariset monikäyttötilat voivat parantaa laivainvestoinnin sisäistä korkokantaa 9,8 prosenttiyksikköä samalla, kun asiakaskokemusten suunnittelu mahdollistaa yhtä korkean palvelutason.

Avainsanat: Asiakaskokemus, Palveluympäristö, Liiketoimintamalli, Risteilyteollisuus
Sivujen lukumäärä: 106

Table of Contents

List of Figures and Tables

1 Introduction

The first chapter introduces the basics of this research. Firstly, servicescapes and related concepts are introduced, followed by the context of the empirical study. The last issues to be defined in this chapter are the research questions in section 1.3, research methods in section 1.4 and the structure of the thesis in section 1.5.

1.1 Introduction to Servicescapes

What describes the value of a good or a service to the customer? Over ages, companies have developed their offerings in a multitude of ways. Some have competed and communicated their value with technical specifications or functionalities, while others have focused on the results the product can achieve for the customer. Still, the tangible aspects have never been enough to assess or forecast the financial success of product offerings. The decision-making processes and valuations happening in the customer's mind have never been fully known.

The customer's perceptions and cognition about consumption have commonly been described as experiences. Anything related to the purchase and consumption of goods or services, however functional it may be, forms an experience. The experiences can be surprising, preferred, unpleasant or a whole variety of other reactions, and ultimately they govern how the customer feels about the product. Thus, all products have some manner of experiential value.

Sometimes the value of a product can be so intangible that experiences alone explain its value and popularity adequately. This is especially true in the case of hedonic services, where the service has little purpose besides enjoyment and its detailed characteristics are difficult to define. The services' success can depend mainly on experiences, which can't be accurately defined.

Focus on managing customer experiences has increased notably in the past few decades. Even though there has obviously been economic activity around experience-based services like performances since early civilization, an organized and academic approach to studying them has existed only since the 1980's. Lately, different points of view on the subject have been gathered under the concept of customer experience management, or CEM. The discipline is about providing stimuli for customers and influencing their subsequent reaction.

Services are known to be particularly complex offerings. Customers can draw experiences from a wide variety of sources in their surroundings. This drives the needs for a specific focus on the

management of physical environments within the field of CEM. They are known as servicescapes (Bitner 1992). The multi-faceted, intangible nature of both customer experiences and servicescapes make them difficult to manage: Meyer and Schwager (2007, 118) report that 80% of managers reached with a questionnaire considered their business to provide superior experiences, whereas only 8% of their customers agreed. In the case of the vast majority of customers, the businesses were left to a competitive disadvantage.

Figure 1-1 reviews the mutual relationships of the terminology used in research. Customer experiences occur in all of business, and while service experiences describe the same phenomenon, they are exclusive to the consumption of services. All features of the product offering can cause experiences. Servicescapes are a more detailed issue within services, as the physical environment can relate to either the surroundings of the core service (in services of the functional type) or they can be a part of the core service itself (in hedonic services). Within their scope, servicescapes have a strong impact on experiences.

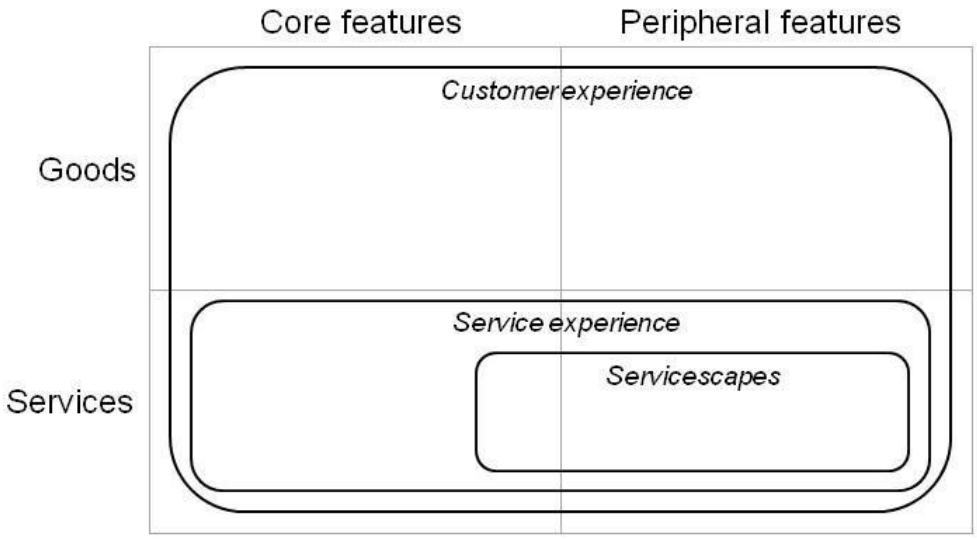

Figure 1-1 The mutual context of customer experiences, service experiences and servicescapes

The research of customer experiences and servicescapes is relatively new and undeveloped. The discipline's progress is made challenging by the complex and highly abstract role of psychology in thought processes. Lacking a definitive theoretical foundation, the field of research is fragmented,

yet fairly comprehensive. Academic researchers have used single-industry examples to test their models of causalities, whereas managerial scholars often specialize in individual elements of experiences and servicescapes.

The fragmentation of managerial literature is a problem when it comes to applying the concepts. A manager looking to improve a service experience can turn to one source for detailed information on a single element like atmospherics (Kotler 1972), but that doesn't describe the entire function of experience design. Even when literature reviews have been written on the subject (Ezeh and Harris 2007), no foothold has been cleared for a comprehensive framework. This study is in need of one for the purposes of the case product.

Using the relevant range of research disciplines as a base, this study seeks to identify the significant elements of servicescapes. Once defined, they are arranged by purpose and scope into a framework of servicescapes. A tool this comprehensive is needed to illustrate how the case product, a cruise ship, serves its purpose as a set of servicescapes. With the recommendations supported by the framework, the evidence behind the ship's ability to generate experiences becomes more consistent than with traditional concepts.

1.2 The xpTray Project and the Research Environment

Cruises are an example of a service where value is heavily experience-based. Their functional value is limited, as they are an inefficient method of transportation and customers are left with little tangible value after the cruise. Hence, their hedonic nature is dominant. A setting providing continuous sustenance and versatile experiences for days, cruises are a diverse and comprehensive example of experiential services, making them a nearly ideal research subject for the theoretical purposes of this study.

The servicescapes for cruise services are cruise ships, the development of which is a result of co-operation between cruise lines and shipbuilding companies. Sometimes the shipbuilder takes the initiative to develop and propose more or less complete design concepts, including recommendations for service improvements across the line. One such design concept is the xpTray ("Experience Tray"), initiated by the STX Europe shipbuilding company in a unit of product development in Turku, Finland.

A group of development project participants was formed around FIMECC, the Finnish Metals and Engineering Competence Cluster. The Royal Caribbean International cruise line and the Maritime Technology unit of the Helsinki University of Technology joined in, funded in part by Tekes, a Finnish agency supporting innovation. Three students were recruited to develop the xpTray design concept as the final theses of their respective master's degrees. They were chosen from the units of the to-be Aalto University: A student of naval engineering, economics and industrial design each.

The research project was given the following starting point: The ship was to have its cabins in a narrow superstructure with public spaces in wide tray-shaped floors below in the hull. The design was intended to force a change from the trend that cruise ships built by shipyards were increasingly larger. The design concept was to be able to support more desirable experiences and be commercially successful against its competition. From this point on, the research team was to evaluate the concept and recommend more detailed design solutions, especially concerning the public spaces where the facilities of individual services are found.

The purpose of the technical thesis (Bergström 2009) is to assess the technical feasibility of design solutions, taking the shipbuilding company's point of view. The economic thesis (this thesis) is to evaluate commercial viability by the viewpoint of the cruise line. The design thesis (Ahola 2009) looks through the eyes and experiences of the passengers, developing interior spaces. The most important interface of this thesis was with the design thesis: To decide on which individual services are to be produced on the ship and what specific design choices are needed to support experiences.

1.3 Research Questions

In order for this thesis to evaluate the value of the ship design to the cruise line, by extension it has to learn its value to the ultimate consumer, the passenger. In other words, both customer value and shareholder value from the cruise line's point of view must be researched. Regarding them, three research questions are proposed in this section.

The focus points of research and the underlying theory has to be chosen based on the needs of the xpTray project. Some of the most fundamental questions are posed by the nature and context of the xpTray design concept. The ship's form made it a radical innovation in a commercial and technical sense. How would the market respond to such a proposal?

Business models are a concept describing value creation. Their elements and development have been studied by rather many scholars, but the scientific community has yet to agree on a single definition of business models. This research aims to use this multitude of explanations of business logic in order to find the most relevant way to describe why cruise ships have developed the way they have, where the xpTray design concept stands among them and whether the xpTray can be assumed to operate successfully in the market.

In universal terms, the focus of the research problem can be found within innovation. By default, all companies should embrace new ideas and applications in order to gain and sustain competitive advantage. However, there are companies and even industries where change isn't as fast as it could be. Is this characteristic an appropriate stance, governed by a healthy attitude toward risk, or is it an undesirable weakness in the structure and culture of the business model?

Most of the previous research on business models focuses on structure. It is to explain how different business models have enabled new, successful business and differentiation. Still, this type of research tends to focus on the result, unable to grasp the change process. Research which specifically concerns business model evolution is needed to answer the question "Why?" not just the "What?" This is where the more specific research area of business model evolution comes in.

Answers regarding business models are derived mainly from theory, with the additional goals of making universally applicable observations regarding them. The research problem is summarized as follows:

Research Question 1: How does the attitude toward innovation evolve in business models?

However, the ship alone doesn't describe the cruise business. It is not the only source of customer experiences, as cruise operations like crew behavior and itineraries have an impact as well. This necessitates that the scope of this research be confined to cruise ship design, with operations taken into account only as an interface.

The universal, theoretical counterpart for cruise ship design is the concept of servicescapes. As in the current paradigm, findings from customer experience research are used to derive theoretical conclusions on servicescapes. This is a way to discover which elements of servicescapes drive

customer experiences and how powerful they are in generating experiences. How much does the design of servicescapes matter in creating customer value, and how can it be improved?

A comprehensive framework needs to be developed to study the whole of cruise ship design elements. Previous research has approached the subject in small fragments, which makes the subject more manageable through gradual improvement, but now the scope of the research is a total overhaul.

The research question seeks its evidence mainly from academic and managerial literature for a solid, theoretical support.

Research Question 2: How do servicescapes influence the customer experience?

The purpose of this research is to go into detail with the recommendations made for the xpTray. Behind this effort, there is a need to discover the counterparts for the universal and rather abstract elements of servicescapes in order to justify the appropriate practices. What features should the xpTray include? Do the choices improve experiential value?

The other side of the coin is economic viability and the competition faced by xpTray. STX Europe and Royal Caribbean International remain capable of continuing to design and produce gigantic, conventional cruise ships, so why would they be in favor of the xpTray? The concept needs to provide superior value at the same cost or the same value at a lower cost.

The third research question is the most empirical of the three, and it considers the entire range of the xpTray's features, challenges and opportunities.

Research Question 3: How does the xpTray design concept conform to the needs addressed by the new, large ship designs?

The first two research questions apply to all businesses, yet they are chosen on the basis of the cruise industry's needs. For this reason, the thesis must alternate between general theory and its

relevant industry-specific applications, even as it progresses from theoretical conclusions to empirical findings in a linear, gradual fashion.

1.4 Research Methods

The xpTray research project is, in essence, a task of product development. Product development is often challenging due to uncertainty about the future and the small amount of information available. Experiential services are particularly difficult to design as the sources of experiences can be unknown. Previous research has been unable to map any kind of customer experiences for a point of comparison.

Based on the above, it is chosen that this research use a variety of different empirical methods. Interviews were held with representatives of the industry: One with the shipbuilding company's vice president of product development and innovation, and another one with the cruise line's naval architect working in the interface with the shipbuilder. The interviews were used to learn facts about the industry and to identify prevalent ways of thinking that influence cruise ship design.

Secondly, the research team drew ideas and conclusions from user perceptions made on a cruise aboard Royal Caribbean International's Voyager of the Seas vessel. Sailing on different seas during the year, the ship represents a similar enough cruise culture as the xpTray would. During the cruise, quantitative observations were made about the utilization of facilities at different times of day, which serves as a basis for designing individual services aboard the xpTray.

Thirdly, the SeaKey and TEC financial accounting tools of STX Europe are used to estimate the cost and profit structure of the xpTray. Using input on the ship's features, SeaKey can calculate the construction cost and TEC the operating revenue and expenses for the first twelve years. Input of completed ship designs are used as a point of comparison for the financial analysis.

The xpTray is in an early stage of product development, so the detailed recommendations depend heavily on pure ideation. This is practiced within the research project team – three thesis writers – with conversation on a daily basis. Many of the ideas are a result of interpersonal communication. The project proceeds under the guidance of the university and the shipyard.

1.5 Research Structure

The research proceeds throughout the paper with general theoretical frameworks and their industry-specific applications intertwined. The first reason for this structure is the need to introduce the relevant scope of theoretical research upon each step taken toward more specific topics; the second are the industry-specific applications.

Chapters 2 thru 5 include the main topics of theoretical research. Figure 1-2 illustrates how their subjects are intertwined concepts. Firstly, service science introduces some of the most underlying concepts behind producing and consuming services. Secondly, the concept of business models explains how competitive forces shape services and the cruise ship industry over time. Thirdly, an essential goal behind business models, value creation can be described by service quality and the customer experience in the industry. Finally, servicescapes define the scope of business development which cruise ship design can influence. As such, they are a cross-section of the aforementioned theoretical concepts.

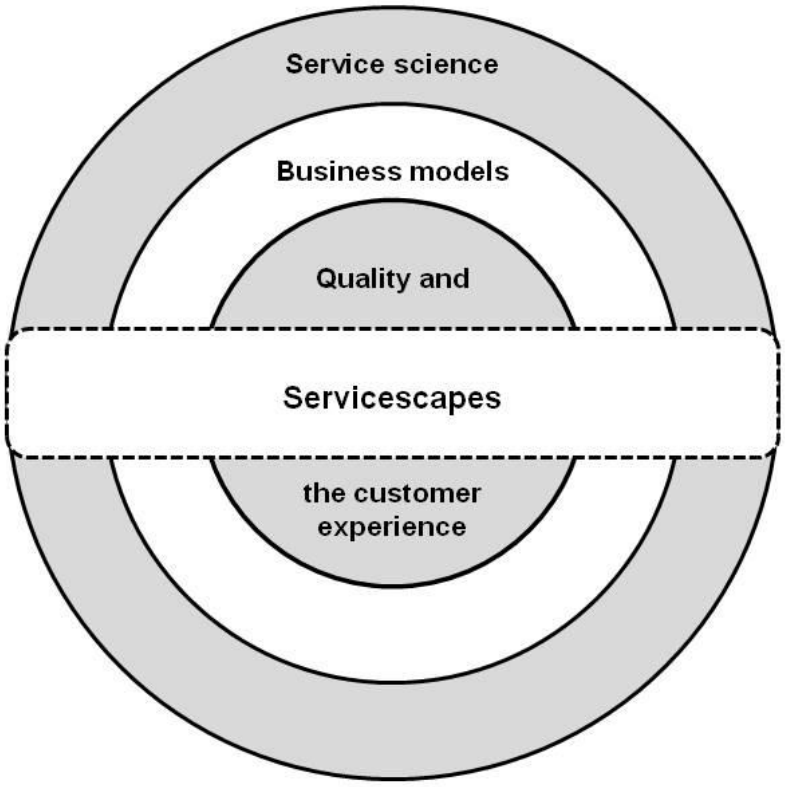

Figure 1-2 Structure of general theory

The detailed purpose of chapters 2 thru 5 is to discover and provide evidence for individual practices that are appropriate for experiential services such as the cruise industry. Cruise ship design as a whole is such a complex and detailed business that recommendations for improvement, too, need to be detailed and diverse. Each layer of theory is needed to justify the relevance of the successive chapters. Once the cross-section of servicescapes is studied, there will be enough observations to move toward industry-specific applications.

Chapter 6 begins a more thorough investigation of the cruise ship industry. Apart from a more detailed description of the industry, change forces and their implications are identified. For chapters 6 thru 8, figure 1-3 illustrates the progression toward empirical research in the case of the cruise industry and the xpTray design concept.

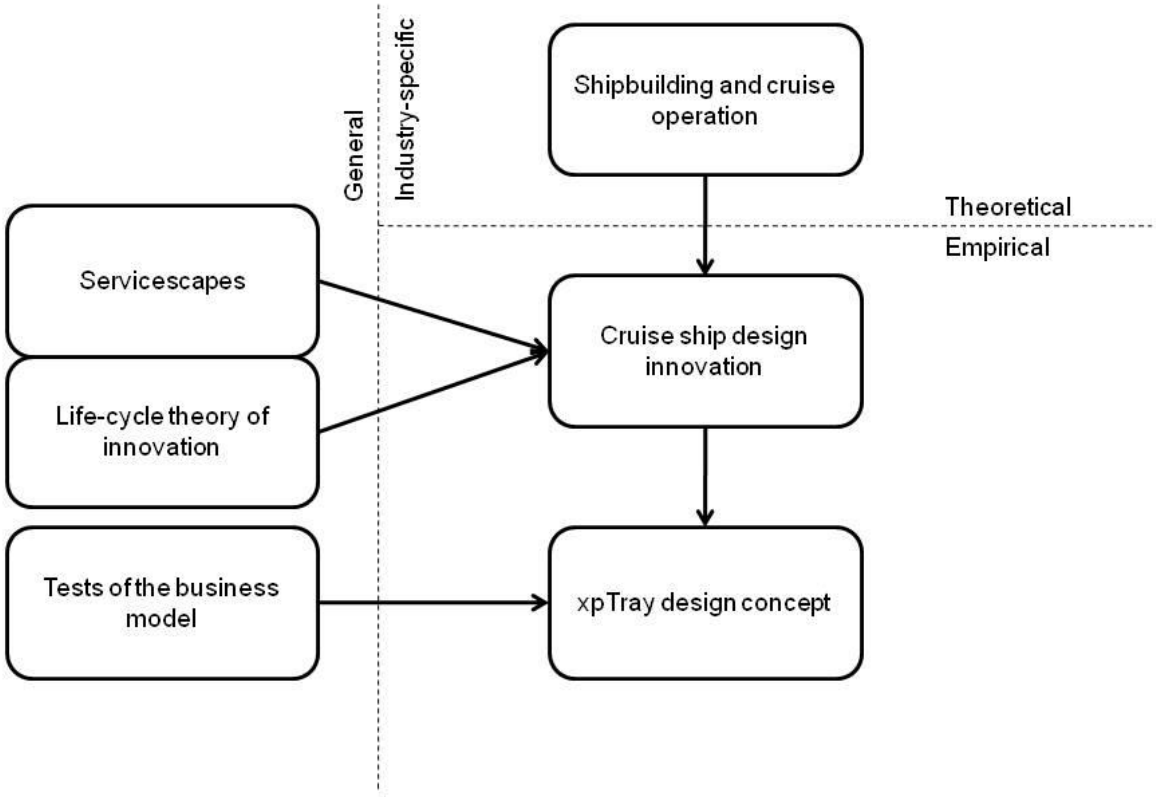

Figure 1-3 Structure of industry-specific applications

Chapter 6 clarifies the context of the case study. With observations on business models and the industry's challenges, it supports the relevance of individual conclusions and recommendations in chapters 7 and 8. It is there where the case study of the xpTray design concept is defined.

The cruise ship design innovation of chapter 7 builds on conclusions from previous research and developed frameworks. With empirical information on the design concept, previous findings are used to make propositions on the general service design guidelines. Finally, in chapter 8 concerning the xpTray design concept, recommendations are made for service content and other ship features using financial analysis tools. Following the empirical analysis are the conclusions of the research.

2 Service Science

Services employ an increasing number of the world's laborers. The size of the service sector is particularly large in developed economies, where manufacturing and extraction are of dwindling importance to the economy.

As a concept, services are diverse and therefore difficult to grasp. The sectors of extraction and manufacturing being simpler to define, the diverse field of services has been treated as their residual. This hasn't made it easy for social scientists to focus on services. In the next sections, this paper takes a look at the previous research on services and its basic nature on which the relevant typologies are based.

2.1 Previous Research on Services

The roots of service science don't go quite as far as those of production and manufacturing. A scientific approach to services was gradually adopted in the first half of the 20th century. Service science gained a more consistent and tangible focus when production management methods were applied to services in the 1960's and 1970's (Chase & Apte 2007, 376).

Further attempts of service science to stand on its own two feet were spearheaded by service marketing from the 1980's on (Pilkington & Chai 2008, 83). Fisk et al. (1993, 65) make a point that it wasn't a jump start for service marketing research, but steady growth for over a decade: They define the evolutionary stages of service marketing to be "crawling out" prior to 1980, "scurrying about" from 1980 thru 1985 and "walking erect" from 1986 to the time of the research in 1992.

Since the early days of service marketing, research on services has become truly multi-disciplinary (Pilkington & Chai 2008, 83). However, the grass-roots level has been slow to reach. Roth and Menor (2003, 147) reviewed that service operations management (SOM) still remained under-represented in the early 2000's. Their view is that SOM is developing off of product operations management the same way that service marketing did from its counterpart, further stating worries that SOM must go through the same debate over whether services are distinctive enough to be relevant to the operations management discipline. It is reasonable to believe that SOM has now gone through the earliest of developmental phases and is now becoming more commonplace.

2.2 The Nature of Services

The distinctive nature of services was the most famously grasped by Zeithaml et al. (1985, 33). According to them, services have four main characteristics as opposed to goods: intangibility, heterogeneity, inseparability and perishability. In other words, their features are difficult to define, they are non-standardized between customers, they are produced and consumed simultaneously and they can't be inventoried. These are strict definitions to go by and may not apply across the field to specific industries. Hence, whether companies produce services or goods is not a binary either/or issue, but rather they combine elements of services and goods in their business.

Operational-level issues further cement the point that services are a multi-faceted business. Roth and Menor (2003, 147) conceptualize the Service Strategy Triad, where the triad is composed out of people (the target market), the product (service concept) and delivery (system design choices). While goods share these strategic issues as well, the model by Roth and Menor points out that service encounters mediate the interaction between the components, trusting the interface between the service and the customer with the key role in the business. When consumption and the mutual agreement to continue the service often happen slowly over time, service research highlights relationship marketing as a pressing need. Grönroos (1990, 5) states that relationships are crucial in service marketing. This is an example of areas of focus that has become essential for goods manufacturing as well, and it represents one of the ways in which manufacturing companies have transformed toward providing services in recent years.

Another view by Roth and Menor (2003, 149) is that the product offered in services has several elements. Core services include the supporting facilities such as décor, facilitating physical items such as ATM cards and facilitating information such as web page design. Furthermore, the core service provides explicit services such as the satisfaction of hunger and implicit services such as social status. Outside of the core lie peripheral services such as valet parking for generating additional value. In conclusion, services rely on a diverse set of tools in an effort to provide many kinds of benefits for the customer.

2.3 Service Typologies for the Cruise Industry

Up to this point, chapter 2 has introduced general and some of the most universal research on services. The purpose of the case study in mind, from now on the paper will focus on whichever concepts are the most relevant to the cruise ship industry. Viewpoints on the production and

consumer value of services, the two sides of the same coin, will be the last topics to cover service science before the paper moves on to more specific topics.

2.3.1 Production of Services

Some service firms are small entrepreneurial establishments, like hair salons, while others can be massive and standardized across the business, like supermarket retail chains. What are the characteristics that make service industries different from one another? Can small and large companies exist in the same market?

One of the most popular service typologies has been the Service Process Matrix proposed by Schmenner (1986, 25). It would measure the service on two axes: the degree of interaction and customization (interpersonal contact and heterogeneity) and the degree of labor intensity (the proportion of costs between labor and capital). The four combinations of these were dubbed service factories, service shops, mass services and professional services. The illustration can be seen in figure 2-1.

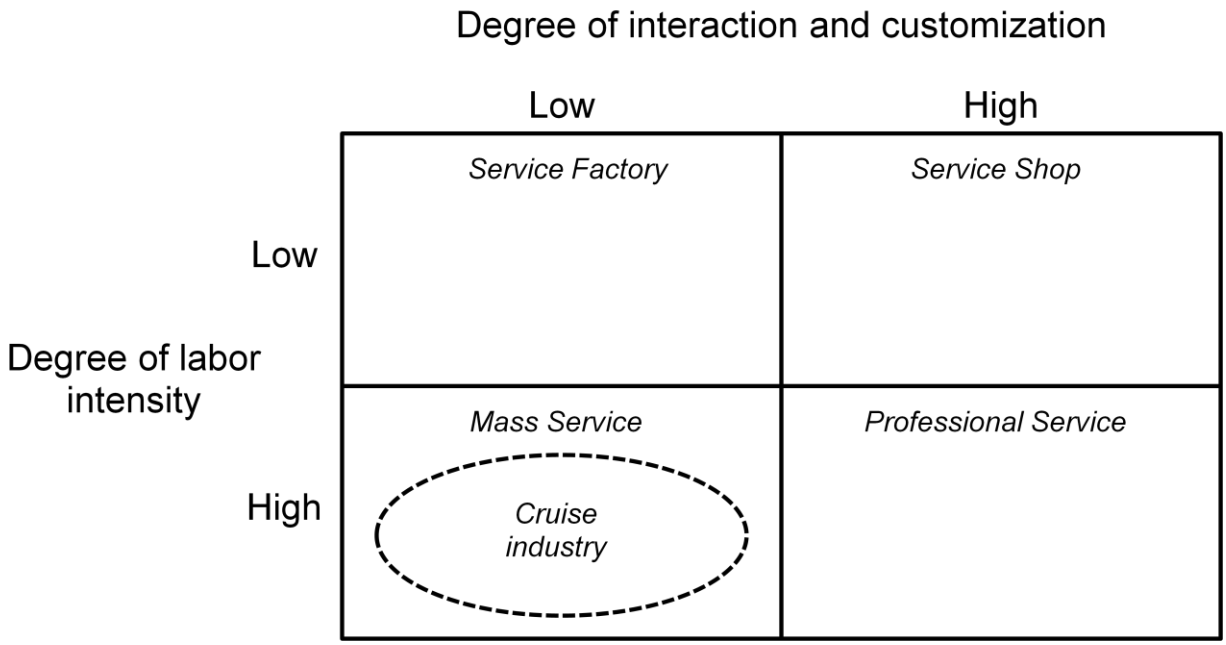

Figure 2-1 the Service Process Matrix, adapted from Schmenner (1986, 25)

The definitions are not always crystal clear. For example, Schmenner lists hotels as service factories and retailing as a mass service, whereas the modern view of supermarkets and accommodation could be quite the opposite. On this basis, the cruise industry isn't obvious to place in a specific category. For example the investment cost on the ship is very high, but on the other hand individual on-board services are provided with substantial manual labor. While the passengers can customize their use of services, they are rarely provided with that much personalization in mind.

The matrix has since been revised by Schmenner (2004, 339). He would explain interaction and customization simply as variation, and the degree of labor intensity was replaced with the generally more relevant measure of relative throughput time (however, this measure isn't that important for the cruise industry, as the service is wanted to be prolonged to a degree). Schmenner (2004, 338) proposed that many service firms are moving along the matrix to shorter throughput times and less variation in order to improve efficiency, and this he called the Theory of Swift, Even Flow.

For a mass service, the Theory of Swift, Even Flow would mean inching toward service factories in an effort to win cost leadership. It must be remembered, though, that the measure of throughput time is indeed relative to other players in the industry (Schmenner 2004, 339). Hence, the revised matrix doesn't so much describe industries as strive to explain competitive actions. The development isn't quite so unilateral, of course, and moving in any direction along the matrix is a means of differentiation.

2.3.2 Value of Services

As concluded above, services provide many different benefits for their customers. The benefits can be difficult to identify and articulate by customers, much less by their providers in order to develop the service. In 1982, Hirschman and Holbrook wrote a seminal article in an effort to understand the complex motives of the customers. The premise of the work was to consider utilitarian (a.k.a. functional) and hedonic value as separate concepts. A description of hedonic value was the new proposition: "*Hedonic consumption designates those facets of consumer behavior that relate to the multi-sensory, fantasy and emotive aspects of one's experience with products.*" (Hirschman & Holbrook 1982, 92). Functional value, on the other hand, has more to do with the consumer's needs and goals. Since then, functional and hedonic value have been counterparts in research (Babin et al. 1994, 645-647).

The research by Wakefield and Blodgett (1999, 54) tagged related concepts to functional and hedonic value. They assessed industries based on the type of value and the time spent in service facilities in order to create a typology of service environments. This established links between the temporal dimension of the service, the physical environment and functional and hedonic value.

Hedonic value would later become one of the fundamental principles in defining customer experiences, which will be reviewed in chapters 4 and 5. The functional side of customer value would always remain in crucial counterpart, though: Gentile et al. (2007, 404) concluded that functional value is generally considered important even with predominantly hedonic products. The two types of value are inseparable, although distinguishable.

3 Business Models

The chapter on service science generally helped explain how service industries function. Companies within industries have considerable differences due to competition, and the concept of business models helps explain the multitude of these differences.

How is the business run? Who are the actors that are producing the service? A business model is a conceptualization of reality, from one viewpoint at a time, and it is unclear where one business model ends and another one begins. In this chapter, this research aims to define these aspects of the business model.

3.1 Previous Research on Business Models

Business models, more so than other related concepts, have raised questions over their nature. While the definitions of business models vary greatly, they are not really in disagreement but explaining different aspects of the business model. Three definitions are presented below:

> *"The business model depicts the design of transaction content, structure and governance as to create value through the exploitation of business opportunities."* (Amit & Zott 2001, 494-495)

> *"Business model is typically a complex set of interdependent routines that is discovered, adjusted and fine-tuned by doing."* (Winter & Szulanski 2001, 731)

> *"A business model is a conceptual tool containing a set of objects, concepts and their relationships with the objective to express the business logic of a specific firm. Therefore we must consider which concepts and relationships allow a simplified description and representation of what value is provided to customers, how this is done and with which financial consequences."* (Osterwalder et al. 2004, 3)

The view of Amit and Zott describes that there are structures and activities within the organization that are used for doing business. As the structures can't change at will, they shape the business model just as the business model shapes them. Winter and Szulanski, on the other hand, emphasize the change and development of business models and the human role in the change. Finally, Osterwalder et al. grasp the concept of business logic: How value is created over time is crucial to

the business model and the success of the firm. Innovation is the source of competitive advantage that provides new value.

Business models appeared in scholarly business journals around 1990, and the usage of the term boomed around 2000 (Osterwalder et al. 2004, 3). Osterwalder et al. don't comment on the academic or managerial nature of these articles. Tikkanen et al. (2005, 790), in turn, claim that business models were still under-represented in academic literature at that time.

The notion that business models are mostly a managerial phenomenon is supported by the illustration of Osterwalder et al. (2004, 4) that the frequency of business model topics trails the NASDAQ market index. It was the "business models" of dot-com startups that fueled investment in the tech bubble. Williams (2001, 399) claims that for this reason, the business model concept was discredited in the tech bubble. Even though failed business models can be considered just as relevant as successful ones, business models are still seeking a more established academic form and the credibility that comes with it. The complexity of the business model concept hasn't helped its popularity.

Like the tech bubble and the current woes of the print media have shown, business models attract attention when they go wrong. This is logical, as companies had business models long before the term was coined. At times of disruptive change, a theoretical concept can help in describing concurrent phenomena.

The challenges that business models face are dubbed 'the narrative test' and 'the numbers test' by Magretta (2002, 90). The business model has a "story" pertaining to the narrative test. The story's task is to align motives and incentives in a way that the business works. The story doesn't only describe the logic of the action but the business's customer appeal as well. The numbers test, on the other hand, makes sure that doing the logical will also be financially viable, ensuring profitability and growth at an acceptable risk.

The business models of firms are increasingly hard-pressed to succeed. Chesbrough (2007, 24) calls for quicker exploitation of capabilities, claiming that rising innovation costs and shorter product life cycles will continue to diminish profits in the future.

3.2 Business Models in the Cruise Industry

Business models in the cruise industry have four types of actors: Firstly, shipbuilders function as the main suppliers in the value chain. Shipbuilding companies build cruise vessels in the shipyards that match the needs of cruise lines, the service providers. Also referred to as ship owners, they make most of the strategic decisions, such as the choice of target markets, investments and consumer branding. Thirdly, cruise lines have outsourced linkages in cruise operation to service companies that run some of the individual services aboard the ship or in itineraries near ports. Finally, cruise lines seek passengers as customers, who as consumers serve as the ultimate goal of the value chain.

3.2.1 Business Models and the Product Development Process

The business model, with all its structures, logic and other intangible factors, can be difficult to perceive. One aspect that can be observed, however, is the locus of change in the business model. How does the cruise industry change their service offering or target markets?

Much of the business logic becomes difficult to change once the cruise ship and its facilities have been constructed. Therefore, shipbuilding companies and cruise lines engage in common product development of individual ships to ensure that the features of the ship be expedient. The product development is conjoined with the sales/procurement process in the industry, which is described in detail by Parvinen and Molinare Kärki (2008) in their case study. Years in duration, the process is gone through for every cruise ship that is built. From a product-specific standpoint, it covers the entire business of a shipbuilding company and sets in stone a substantial part of the cruise line's service offering as well.

Tikkanen et al. (2005, 793) provide a framework for analyzing change in business models. They postulate that the material aspects of the business model (e.g. organizational structures) influence managerial cognition of the business model (e.g. managers' beliefs in how good a standing their products are). The managerial cognition, in turn, mediates the actions of the company and their outcomes. The outcomes may lead to the changing of the structure or cognition in a way that the aspects all influence one another. Cognition has been studied in strategy research as well, with Doz and Kosonen (2008, 137-139) defining it both a lever and a tool for strategy-making.

In the sales/procurement process the cruise industry builds organizational structures for the creation of a cruise ship. The people involved define the content of the business transaction, like ship features and price. During the long process, there is a certain degree of iterative planning, where previous decisions shape cognition and the changed beliefs can lead to different action and outcomes. Above all, the aim of the process is to create a platform for doing business: The ship has its own value creation logic. Based on this premise, it is proposed that this process of sales/procurement and product development in the cruise ship construction is the key driver of the business model and vice versa, since it is by far the most significant arena for change.

However, shipbuilding companies and cruise lines each have their own strategic objectives, competitive positions and perhaps different managerial cognitions. Each party obviously operates a business model in their respective businesses. Still, they engage in common value creation and the alignment of objectives with each ship to be constructed. Between the different ships, the different suppliers of cruise lines and the different customers of shipbuilders, there are several combinations of value creation. What are these overlapping business models?

The proposition regarding the business models of the cruise industry is that a specific business model is operated in the sales/procurement interface between shipbuilding companies and cruise lines. In general terms, the implication is that locus of change in business doesn't necessarily fit within existing business models – even if the change takes place within the current core business, like cruise shipbuilding. The platform that is created as a result can serve as its own business model. Therefore, it is proposed that each cruise ship be considered a business model of its own. This will be further discussed in the next section.

3.2.2 The Cruise Ship as a Business Model

In the previous section it was established that the process of creating cruise ships has the definitive aspects of a business model. In this section, it is proposed that the ship itself operates as a platform of a business model. Following an introduction of the business logic of the cruise ship, the previously introduced concept of inter-organizational overlapping business models is compared to the concept of business nets (Möller & Svahn 2003; Möller & Rajala 2007).

The construction of a cruise ship is a strategic project. Each ship can stay in business for decades (Ward 2009, 177-666), making the lifespan comparable to individual companies. Moore's (1991) work on business models illustrates that they experience life cycles. So do cruise ships; older ships

with fewer features but more history and charm provide an alternative to newer vessels. During its lifespan, a ship will undergo refits in an effort to renew. Some of these refits may include rebranding: Ships can be sold from one cruise line to another. Even though at any given time they must operate as an expedient part of the cruise line's "product range", the business model platforms can be detached and joined to another fleet.

The Revenue Model of Cruise Ships

Much of the revenue is generated independently from the operation of other ships. The revenue model is a crucial part of the business model, and in the case of cruise ships, it isn't as simplistic as a unilateral value chain. Cruise lines gain revenue from both the admission of passengers and the services consumed aboard. The balancing of the two is a complex issue.

Eisenmann et al. (2006, 94) elaborate on the concept of two-sided markets. In their theory, there exists a platform owner (in this case, the cruise line) that links together service providers (shops, restaurants etc.) and their potential customers (passengers) on their platform (ship). The passengers want to get aboard the ship when there is larger number of interesting services available. The service providers, in turn, want to establish themselves on the ship when there is a large, attractive market of consumers available. The virtuous circle is fueled by positive network effects.

The platform owner can extract their revenue from these two parties. The passengers will pay for admission (often bundled with some services like accommodation in a cabin) and the service providers will pay rent and/or other fees for their presence. On cruise ships, some services like sunbathing are included in the admission price and chargeable services may be operated by their cruise line, but the pressure on revenue generation remains the same.

In order to attract the optimal combination of passengers and revenue from services, the cruise line may need to unbalance the markup on the fees of the two sides. One of the sides of the market is called the subsidy side, which gets lower fees in order to attract a larger number of participants; the other side is the money side, which is the main source of revenue, as they have a higher willingness to pay for participation (Eisenmann et al. 2006, 94). For example, the Royal Caribbean International cruise line adjusts prices in order to sail at full passenger capacity at all times (Soinila, interview). In other words, cruise lines want to attract more passengers to spend money while aboard the ship.

The theory of two-sided markets isn't optimal for the cruise industry. It was mainly created for information products where variable output costs are tiny and capacity is unlimited, whereas on cruise ships capacity is strictly limited. This places a limit on network size and the associated network effects, the importance of which are emphasized (Eisenmann et al. 2006, 94). Furthermore, besides the cross-side network effects of supply and demand described above, there are same-side network effects, which too can be either positive or negative. Service providers often don't appreciate competition when their number grows larger. In the case of passengers, same-side network effects involve crowding, which can seriously dampen their enjoyment of the cruise. In conclusion, while some of the key implications of the theory may remain insignificant for the cruise industry, it does help explain pricing issues concerning cruise operation.

Strategic Nets in the Cruise Industry

The past couple of decades have ushered forth an era of network economies, where companies engage in more collaboration to share tasks or generate value. The form of these networks can be difficult to shape. One such attempt is strives to define individual parts of networks, defined by the extent of actors who work together in the same value chain. Möller and Svahn (2003, 213) call these important linkages strategic nets or strategic business nets. These nets can be of many different types. Mainly, Möller and Svahn (2003, 215) form a typology of the nets based on the degree of establishment in the value system. In one end of the spectrum are stable, well-defined value systems while in the other are emerging value systems driving radical change.

Möller and Rajala (2007, 899) elaborated on the typology by defining the purposes of the value systems. Well-established value systems are current business nets to continue collaboration, in the middle are business renewal nets striving to renew and develop current linkages and in the more volatile end are emerging business nets. The business renewal nets, for example, are divided into business renewal nets (of the same name) that are designed to improve current linkages and business processes, and customer solution nets, which provide the sales of projects. The nets are better defined by the scope of business-to-business collaboration rather than the ultimate purpose of serving the consumer, which doesn't necessarily vary between the types of strategic nets.

Figure 3-1 outlines the strategic net of the cruise industry. It is a simplified view in the sense that it doesn't make a difference between in-house and outsourced on-board services, and secondly,

according to Andersson (2008) the industry's networks can nowadays have horizontal linkages, which are not pictured. The diagram illustrates the two-sided market of cruise operation as well.

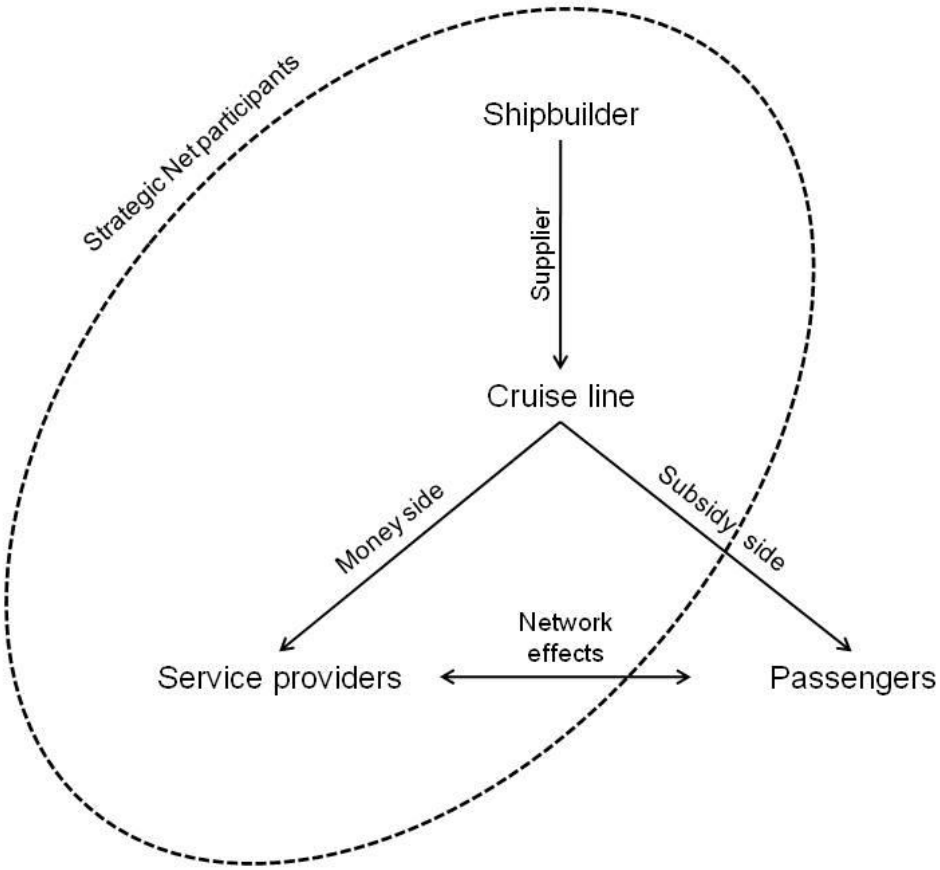

Figure 3-1 The strategic net and the two-sided market of the cruise industry, adapted from Möller and Svahn (2003, 213) and Eisenmann et al. (2006, 94)

This is a contrasting view to the notion of the cruise ship being a separate entity. This is because strategic nets are focused on continuous collaboration rather than a single transaction, the figure illustrating the companies' roles over time. However, single transactions do fit in the concept, as those are the definition of customer solution nets (Möller & Rajala 2007, 899). In the customer solution net of the cruise industry, the cooperation provides solutions to the cruise line. The projects have explicit goals and schedules, organized as multi-party projects (Möller & Rajala 2007, 903), and improvements are typically incremental (Möller & Rajala 2007, 899). Since these

characteristics are typical of the cruise ship industry, it is proposed that the companies operate a customer solution net.

3.2.3 Innovation in the Cruise Industry

The previous section concerned the organizational linkages of change and business logic. This section, on innovation, seeks to answer questions about what the change is. Success in creating a new way to differentiate the offering and create value is generally defined as innovation. As such, innovation is a driver of competitive advantage in business models.

What can players in the cruise industry innovate that their competitors can't? One target of innovation are the tangible services, facilities or cruise destinations that influence customer perceptions. Another goal is to improve the technical qualities of the ship that are invisible to others but help cut costs without decreasing value. Generally, since customer value is so highly dependent on customer perceptions, such innovation must be visible and therefore imitable in principle. What does protect the sustainable advantage, though, are the long lead times of procuring a ship. Once competition finds out about a great idea for a new on-board service implemented on a ship, they are still many years away from finishing the construction of a ship that features the same service. This helps make innovation on customer value worthwhile in the industry.

The nature of innovation research varies between industries. Being a key driver of change, technology is a commonly researched focus of innovation. Such innovation research is represented by Moore (1991) and Christensen and Raynor (2003), among others. Their research field is dominated by views on the diffusion of innovations, i.e. the speed and scope of customer acceptance of new technologies. A research field more relevant to the cruise industry, hedonic innovation mainly focuses on customer experiences. The value of hedonic services is perhaps more ambiguous, but certain conclusions have been drawn. Prahalad and Ramaswamy (2003, 17) postulate that experiential value is co-created by the service provider and the customer. This implies that not only must companies providing experiential services be demand-driven in their innovation, but the innovation itself must happen in the front office with the customer. On another note, Prahalad and Ramaswamy (2003, 17) define technology's role in experiential innovation to be a facilitator in creating experiences.

These days, innovation in the cruise industry takes place in networks (Andersson 2008). As noted above, customer solution nets aim for incremental improvements. The incremental and radical

innovation types described in the case of strategic nets are mirrored by the concepts of sustaining and disruptive innovation, which are researched in the book by Christensen (1997). Sustaining innovation builds upon current achievements, whereas disruptive innovation replaces them. Disruptive innovation is such that it temporarily decreases product performance, when innovators are thrown back to an early stage of learning.

Customers are naturally wary of this disruptive change. Moore's (1991) concept of "crossing the chasm" describes customer anxiety toward discontinuous innovation. This is more than natural in the cruise industry, where each ship is a massive investment. Instead, the focus is mainly on sustaining innovation. Disruptive innovation could bring about operational and technical risks, but consumer acceptance and brand consistency are the biggest challenges. Even building ships that are "too good" could be harmful; cannibalization of one's own products is especially problematic when the profitability of investments depends on life cycles of more than ten years and replacing the industry's obsolete vessels could take decades. Eloranta (interview) explains that the attitude toward revolutionary ideas can be hostile at worst. This could make it difficult to question the value of prevalent solutions.

Christensen and Raynor (2003, 228) state that sustaining innovation is achieved with deliberate planning, whereas disruptive innovation comes from discovery-driven planning. The concept of deliberate planning is consistent with the industry's sales/procurement process being a key source of innovation.

Innovation and the Life Cycle

A fundamental point in Moore's (1991) work is that different stages of the industry life cycle call for different types of innovation. In the case of the cruise industry, it should be considered to operate in a mature market. The industry dates back to the luxury ocean liners of a hundred years ago, and it has gradually developed over the decades. It shows no signs of decline, quite possibly due to its hedonic nature.

Innovation in mature markets takes places in two areas: the customer intimacy zone and the operational excellence zone (Moore 2005). The former is about providing new value to the customer, while the latter decreases the costs of delivering the same value. They can be considered to help compete on the principles of differentiation and cost leadership, respectively. As explained

in the case of the cruise industry, innovations in the customer intimacy zone are generally more imitable than those in the operational excellence zone.

Not all innovation will be considered relevant for the scope of this thesis. Firstly, only innovations that pertain to cruise ship design are considered; for example, some aspects of customer service such as handling customer complaints are ignored. Secondly, innovations in the technical features of the ship, such as the steel structure, are omitted. Some of them can be found in the research by Bergström (2009). Even so, as evident in the chapters 5 thru 7, the design of the cruise ship has implications on several aspects of the service.

Below in table 3-1 are the innovation types for mature markets in the customer intimacy zone and the operational excellence zone. Their application to the cruise industry follows.

Table 3-1 Typology of innovation types in mature markets, adapted from Moore (2005)

Area	*Innovation type*	*Description*
Customer intimacy zone	Line extension innovation	Distinctive subcategories of products
	Experiential innovation	Elements of the customer experience
	Enhancement innovation	Increased revenue from a reinforced market position
	Marketing innovation	Enhanced marketing channels and marketing content
Operational excellence zone	Integration innovation	Systems and linkages between individual products
	Value engineering innovation	Reduction of features of insignificant importance
	Process innovation	Achieving the same value with fewer resources
	Business model innovation	Repositioning in the value chain and markets

Some of the above categories are relevant for cruise ship design. Adding a new ship into the fleet operated by a cruise falls into the category of line extension innovation. This is a means of differentiation, enabling the cruise line to target new customer segments. The ship design naturally must be aligned with the goals the cruise line has concerning its fleet. The cruise line can also benefit from the extension of their fleet by brand value migration, when the brand of preexisting ships shapes perceptions about the new ship and vice versa.

In terms of the customer experience, experiential innovation has two broad fields of work: the layout of the ship and the on-board service offering. Firstly, the ship design must be functional. Crowding and passenger flows are an issue, and especially the accommodation of passengers in cabins is crucial to the enjoyment of the cruise. Impressive design, such as that of an exceptionally large vessel, can have a large impact on the customer's expectations as well. Secondly, the service offering is about the choices and design of individual on-board services. The cruise line needs to incorporate a balanced, attractive portfolio of services into the ship design. Innovation on how to make specific services better falls into this category as well.

In the customer intimacy zone, enhancement and marketing innovation are not relevant for the design of cruise ships. This is also the case with the process innovation and business model innovation of the operational excellence zone.

The boundary between front-office customer intimacy and back-office operational excellence isn't absolute. For example, as integration innovation concerns the systems and linkages between individual services, they also affect the customer experience. Interior design themes are an example of such innovation: When applied consistently and appropriately, they allow the creation of a continuous experience. This wouldn't be possible without operations governing the use of spaces aboard the ship. The second field of integration innovation in cruise ship design is service experience flows, the schedule and sequence by which passengers use services. This temporal and spatial dimension is typically governed by dining times, hours of sunlight etc. although with careful planning, the ship design can lay paths that are natural for passengers to use, and the placement of services and touch points can create an omnipresent service experience.

Finally, in value engineering innovation, a way to reduce features that don't provide much value, which hasn't been listed yet, is utilization. Higher utilization rates for services and premises can be achieved by capacity management and multi-purpose facilities. Space is extremely costly to

construct and operate on cruise ships. While some spaces are best left sparse for the enjoyment of the passengers, many others such as shops and restaurants aren't even accessible at quiet hours. Their facilities could be put to other uses at other times, or perhaps they need not be given such specialized facilities for providing the service.

4 Quality and the Customer Experience

Innovation theory (Prahalad & Ramaswamy 2003, 17) and the application of innovation types for cruise ship design suggest that the customer experience is a key component of success in services that provide hedonic value. In this chapter, the nature of customer experiences is researched, and for that purpose the related concept of service quality is introduced first.

4.1 Quality in Services

Quality as a term is widely used, but as Parasuraman et al. (1985, 41) state, quality is difficult to describe. It can serve as the definition for supremacy, customer, success in providing the intended value, or more. Due to versatile nature, quality tends to establish linkages to a multitude of related concepts.

Service quality research took off in the 1980's. Perhaps the most long-lived framework of service quality is the SERVQUAL model proposed by Parasuraman et al. (1985) in their seminal work. SERVQUAL includes the Quality Gap Model (Parasuraman et al. 1985, 44), which identifies the instances in which the perceived service doesn't meet customer expectations. Quality problems originate from these gaps. The strength of the model is its comprehensiveness, as no possible gap was excluded.

More popular among followers of the two models, the SERVQUAL listed numerous dimensions of service quality. Parasuraman et al. (1985, 47) originally proposed ten dimensions: reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding and tangibles. Later the list was revised to include just tangibles, empathy, reliability, responsiveness and assurance (Parasuraman et al. 1991, 423).

Quality research continued to develop in the field of production as well. Garvin (1987, 104-108) proposed eight dimensions of quality: performance, features, reliability, conformance, durability, serviceability, aesthetics and perceived quality. While not strictly limited to products, Garvin's dimensions are difficult to apply to services as such.

4.2 The Service Experience

The customer's service experience is one of the phenomena related to service quality (Frow & Payne 2007, 89). As such, it can be an equally elusive concept. As the Service Strategy Triad of Roth and Menor (2003, 147) implies through service encounters, the service experience can be driven by operations. As established above, innovation is a change force in shaping service experiences.

4.2.1 Previous Research on Customer Experience Management

An overview of previous research reveals that the science of customer experiences seems to be managerially generated, not consistently derived from behavioral science. While elements of behavioral science exist in certain frameworks, other established and central works on customer experiences are not based on such conceptualization. The literature is rather driven with the following questions in mind: Which aspects of the customer experiences can be influenced? How can businesses benefit from customer experiences? Pullman and Gross (2003, 220), Mosley (2007, 126) and Frow and Payne (2007, 89) state that commonly the aim of managing experiences is to develop customer loyalty.

The roots of customer experience research are in the research of experiential consumption by Holbrook and Hirschman (1982). The first conceptualization of customer experiences was the identified aspects of fantasy, feeling and fun (Holbrook & Hirschman 1982, 132). It took another decade and a half before a field of research took shape: Patterson et al. (2008, 29-30) state that the superlative claims of Pine and Gilmore (1998) and Schmitt (1999) about the advent of the "experience economy" started a bandwagon on which other researchers would hop. A decade later, Patterson et al. (2008, 29) would point out that a limited number of success stories has been repeated in literature, while other firms continue to fail in their efforts to create experiential services. Their criticism isn't quite fair, as a notable rate of failure is typical of all management concepts. By this time, the management of experiences has outlived typical management fads.

Nowadays the discipline is the most commonly known as customer experience management (CEM). The aim of the philosophy is to promote a holistic view and constant attention to the experiences created by products and services. Frow and Payne (2007, 89) see that CEM is gaining ground in both academic and managerial literature in the field of customer experiences. According to Meyer and Schwager (2007, 118), CEM strives to be the answer to poor service quality. Another

purpose of CEM is the use of experiences for brand management (Meyer & Schwager 2007, 130; Mosley 2007, 123) There is now a juxtaposition of managerial concepts, as CEM is compared to customer relationship management (CRM) and it attempts to make up for the aspects CRM has traditionally ignored (Meyer & Schwager 2007, 130). The controversy isn't great due to the fact that the responsibilities of each concept aren't strictly defined. Whether they actually are competing views is unclear.

4.2.2 The Experience Economy as a New Paradigm

One of the implied characteristics of experiences is that they are something better than just the elements of a good service. Novelty and other very implicit qualities are demanded of experiential services. Such characteristics can make their evaluation very complicated. For example, if customers of experiential services are meant to be surprised, would the Quality Gap Model, based on matching the customer's expectations and perceptions, still apply? Such discrepancies underline the difficulty of grasping the concept of experiences with established tools. Instead of preliminary planning, situational factors and reaction play the leading role. Bitner (1990, 79) found that service encounters may become more satisfying than expected if the customer's understanding of the situation is properly addressed. The conclusion is that services may surpass expectations in their co-creation if properly managed.

Coining the term "experience economy", Pine and Gilmore (1998) wrote a seminal work explaining the context and typologies of experiential services. Experiences were said to follow extraction, manufacturing and services as the next source of economic value (Pine & Gilmore 1998, 98). While the widespread use of that context shouldn't be anticipated, the authors' listing of economic distinctions between the sectors (Pine & Gilmore 1998, 98) is very descriptive. According to them, experiences are *staged*; they are *memorable* rather than specifically tangible or intangible; they are *personal* rather than standardized or simple customized; their consumption takes place as they are *revealed over a duration*; the seller is a *stager*; the buyer is a *guest*; and users look for *sensations* rather than benefits.

How is the service experienced viewed by the customer? Pine and Gilmore (1998, 102) define four realms of experience: entertainment, education, aesthetics and escapism. These are based on whether the consumers are active or passive in their participation and whether they are meant to

become absorbed or immersed in the experience. Pine & Gilmore (1998. 102) claim that the best experiences combine these realms rather than strictly specialize in one of them.

It would take more than Pine and Gilmore's work, however, before research revealed more of the key characteristics of experiences. Experiences are difficult to manage, as Meyer and Schwager (2007, 118) conclude that experiences are the customer's internal and subjective responses. Hence, experiences exist only in the customer. This definition has crucial implications on the behavioral research on the subject. A similar approach was used when Pullman and Gross (2004, 569) found empirical backing for their hypothesis that basic emotions play a strong mediating role in loyalty behaviors – those closely related to the management of experiences. The research was building on the foundation (Pullman & Gross 2003, 220) that experiential contexts, emotions and time determine loyalty. The inclusion of time is consistent with Grönroos' (1990) emphasis on relationships in the service industry, reinforcing the validity of the concepts.

Causal relationships have been the most common form of empirical research in the field of experiences. Multi-item scales have also been proposed and tested, for example by Gentile et al. (2007, 398), who proposed that experiences have sensorial, emotional, cognitive, pragmatic, lifestyle and relational components. These components would form a typology of experiential products, defined by consumer behavior. Chapter 5 will feature more of the behavioral research on the subject of experiences.

4.2.3 Operations in Customer Experience Management

The previous section concerned how the service experience is viewed. In the section it is postulated that the staging of service experiences is the most heavily dependent on operations.

A fitting summary of what it takes to create an experiential service is the quote by Pine and Gilmore (1998, 100): *"Companies should think about what they'd do differently if they charged admission."* In other words, individual services within a context such as a mall or a cruise ship aren't enough: The entire context must be saturated with experiences. According to Carbone and Haeckel (1994, 18) experience design takes place mainly in the context, but it is a performance issue as well. Operations must deliver consistently, or the experience might not be satisfactory.

Voss et al. (2008, 255) conceptualized the Experience Strategy Matrix, which pertains to the organization's capability to stage experiences appropriately. Two variables, the depth of use of the experience (going from simply experience-based marketing to experiential products and ultimately

treating services as destinations for the customer) and the degree of integration within the organization (cross-functional experience design) must be aligned; otherwise the experiential benefits remain too difficult to extract or the company is incurred too heavy costs. Their conceptualization of services as destinations has four key propositions (Voss et al. 2008, 253-254):

1. Experiential cues and the service offering must be replaced and renewed on a regular basis to encourage repeat visitation.
2. The length of the service should be extended for the experience to sink in.
3. The service should offer multiple different experiences for variety and novelty value.
4. Experiential content should be created even in those aspects of the service which previously had none.

The field of research in experiences is fragmented but not mutually exclusive. Many of the researcher offer individual key concepts as examples of the building blocks of experiences.

Perhaps the most important components are interpersonal relations, which are emphasized by Mosley (2007, 126). As established, services have a lot of interpersonal interaction by nature. For example, Mittal and Lassar (1996, 104) discovered proof for their proposition that interpersonal relations are more important in services that affect people rather than in products. Note that the term "personal service" is used partially interchangeably for interpersonal relations and service characteristics that have to do with the customer's person, but for all intentions and purposes, the two concepts are inseparable. According to Prahalad and Ramaswamy (2003, 17), value co-creation in experience innovation takes place individually between people. Elaborating on this, Meyer & Schwager (2007, 126) point out that customers are not the only people whose experience governs the value creation, but that employees are a key target of CEM.

In their review on services, Fisk et al. (1993, 80) define service encounters and experiences as intertwined concepts. Based on this, it is proposed that touch points in the service are where the experience is created. This requires a broad definition of touch points, as even the quietest moments in service facilities can feature them, such as a glance at the interior design.

An example of such touch points are defined by Carbone and Haeckel (1994, 9) as service clues in managerial literature. They are a related, elaborate concept of services cues (which are defined by Ezeh & Harris 2007, 61) Examples of clues are the tidiness of hospitals, posters of fit people in gyms and mascots in theme parks. Clues are the touch points of service experiences (Berry et al. 2006, 44). They are of varying type and significance, as Berry et al. (2006, 44) remind that they can

relate to both people and physical environments. Relating to their view on service experience design, Carbone and Haeckel (1994, 11) divide clues into context and performance clues, depending on regarding which they provide experiences.

A further typology of clues is provided by Berry et al. (2006, 46): Clues are functional, mechanic or humanic. Functional clues, hinting of how well the service performs as intended, affect the calculative perceptions of customer. Mechanic clues (objects influencing impressions) and humanic clues (behavior in interaction), in turn, affect emotional perceptions. The use of humanic clues for service experiences is consistent with Bitner's (1990, 79) research on customer satisfaction through interaction mentioned above. In conclusion, this outlines personal interaction and touch points as the most important building blocks of customer experiences.

4.3 The Cruise Industry as an Experience-Based Service

The purpose of this section is to evaluate the performance of the cruise industry in creating service experience based on the theory presented so far. Like the applications of theory to the cruise industry in above chapters, it is meant to direct the focus of further theory into relevant niches.

A necessary underlying assumption would be that cruises are indeed an experiential service. This is reasonable to assume, considering the hedonic and diverse nature of the service. Organizational issues such as the alignment of the depth of use of experience and the degree of integration by Voss et al. (2008, 255) are excluded from the analysis as the focus is on individual cruise ships. Still, with the conclusions of the previous section in mind, the organizational task of coordinating employees can't be completely separated from cruise ship design.

Firstly, the four propositions by Voss et al. (2008, 253-254) are applied and evaluated:

1. The replacement of cues and offerings does take place on a regular basis, as ships go through maintenance and refits. The question remains, how often and how thoroughly should it be done? Can replacements be done without taking the ship out of commission?
2. The duration of the service experience is indeed long. The durations of cruises are naturally scheduled and they come in many varieties, from transportation between ports to tours around the seas that take months.

3. The variety of services (especially aboard new ships) is great, but so is the pressure to increase variety even further. Just how much is enough? What are the components that build an experience of variety? This issue will be discussed further in chapters 6 thru 8.
4. Whether all on-board services have experiential content is likely to vary greatly between ships and their respective services. Naturally, an appropriate challenge for cruise lines would be to add experiential content to every service or identify and eliminate non-critical services that aren't experiential.

Secondly, personalization and physical environments were found in the previous section to be essential to service experiences. On the subject of the personal attribute of the service, recall that Pine and Gilmore (1998, 98) found it to be comparable to standardization and customization. In the case of the Mass Service that cruises are, the level of personalization just isn't sufficient. With up to thousands of passengers aboard the ship, individuals rarely have a broad personal contact with the staff co-producing the service. Many of the services are standardized (e.g. sunbathing) or perhaps customized for segments (e.g. cabins). While some can be about the personal attributes of the passenger (e.g. personal training at the gym), such services are in the minority. Understandably, increasing personal contact in services would incur higher personnel costs, so cruise lines are reluctant to do so.

Is personalization an improvement over standardization and customization, or is it merely a different attribute? Mittal and Lassar (1996, 104) discovered in the context of health care and car repair that the social context of interaction is indeed an improvement over traditional perceptions of service quality – recall that for Pine and Gilmore (1998, 98) experiences are a progression from traditional services. Mittal and Lassar (1996, 97) revised a SERVQUAL-P scale over the traditional dimension, adding the attribute of personalization, which is related to the empathy dimension. Their finding was that personalization can explain perceptions of quality that traditional SERVQUAL can't (Mittal & Lassar 1996, 103), especially in a service where people, not products, are processed.

To conclude, the personal attribute is crucial for a service such as cruises, but the industry doesn't address this need as well as it should. The other important subject, physical environments, is explored in the following chapter.

5 Design of the Physical Environment: Servicescapes

In previous chapters, service science and business models narrowed the focus of research to customer experiences. Previous research on customer experiences revealed the importance of physical environments. In the context of cruise ship design, physical environments relate to each of the above subjects. So far many concepts such as innovation, service co-creation and service clues have been found intertwined; more such linkages are found in this chapter, as the physical environments are a cross-section of previous topics.

Physical environments play a large part in experiential services. This is illustrated by the examples of Voss et al. (2008, 259). Prahalad and Ramaswamy (2003, 17) postulate that the focus of experiential innovation is in environments, not in products or process. For the purpose of this research, cruise ship design can affect the customer experience only through physical environments, either directly or indirectly through employees, operations or itineraries.

5.1 Previous Research on Physical Environments

The interface of services and the related physical environments were given a name, "Servicescapes" by Bitner (1992) in her seminal research. The definition of servicescapes is as follows: *"The dimensions of the physical surroundings include all of the objective physical factors that can be controlled by the firm to enhance (or constrain) employee and customer actions."* (Bitner 1992, 65)

The importance of physical environments in business was first made popular by Kotler (1972) in his research on "atmospherics", i.e. sensory stimuli. Stimuli and the ensuing response play the main role in servicescapes research (Ezeh & Harris 2007, 62). Retail environments have been popular objects of study, probably because of the simplicity of the service and the multitude of available purchase decisions.

As found with the research of customer experiences, managerial and psychological implications in servicescapes have been difficult to combine into coherent theory. The line to be drawn between the environment and other service aspects remains unclear. Voss et al. (2008, 259) conclude from the experiences of businesses that the financial impact of physical environments has been difficult to estimate. Furthermore, as a result, they have also observed overinvestment in physical environments.

5.2 Servicescapes and Intertwined Concepts

As introduced above, servicescapes are a rather coherent concept. The following subsections establish that servicescapes have a great deal of interfaces with the details of service management. Progressing from context to characteristics, this section culminates to the proposition of a framework, which presents a taxonomy of elements in servicescapes.

5.2.1 The Context of Servicescapes

In chapter 3, it was introduced that Magretta's (2002) work paints a comprehensive picture of how business models are stories to be told. It has also been established that brands are a part of experiences. Experiences, in turn, are a part of the business model when creating customer value.

The conceptualization of Ponsonby-McCabe and Boyle (2006, 175) links brands and servicescapes as well, stating that "brandscapes" are experiential spaces in which the brand mediates the customer experience. This is a reasonable assumption, considering that the Service Gap Model (Parasuraman et al. 1985, 44) defines marketing communication to affect expectations of service quality. Also, Mosley (2007, 130) proposes that a business has brands for both employees and customers, and the expectations driven by the brands mediate the management of customer experiences. Another linkage is introduced by Haeckel et al. (2003, 23), according to whom environmental clues deliver the brand.

5.2.2 The Characteristics of Servicescapes

In her introduction of servicescapes, Bitner (1992, 60) explains that environmental dimension create holistic environments, which serve as perceived servicescapes. As with customer experiences (Meyer & Schwager 2007, 118), it is the customer's attributions that matter, not the managed components of the servicescapes.

The original listing of the aspects of servicescapes by Bitner (1992, 65) include ambient conditions, spatial layout and functionality, signs, symbols and artifacts. In their review of servicescapes research, Ezeh and Harris (2007, 64) form an overview of factors: ambient factors, design factors and social factors.

Atmospherics as defined by Kotler (1972, 51) are commonly present in servicescapes research: visual, aural, olfactory and tactile dimensions are those in which senses can be stimulated. Kotler's

(1972, 54) study postulates that the benefits of atmospherics relate to the probability of purchase by modifying the buyer's information and affective state.

Regarding personal aspects in servicescapes, Bitner (1992, 58-67) presents two conclusions that are slightly contradictory. The first is that servicescapes affect both customers and employees. Compared to the findings on service experiences, this implies that physical environments have an impact on customer experiences through employees as well. The second proposition is that servicescapes are particularly important in self-service environments when no employees are present. Still, this underlines the importance of servicescapes either with or without the presence of employees.

In terms of other uses, it is proposed by Newman (2007, 17) that dimensional servicescapes (elements that have significant impact on space and time) are the design elements of space and wayfinding. These can be very functional uses, such as signage helping customers find their way around the environment. On the other hand, Newman (2007, 17) conceptualizes that dimensional servicescapes serve as stimuli for pleasure, arousal or dominance, which elicit a reaction of either approaching or avoiding the origin of stimulus.

Service quality research has been applied in servicescapes as well. Using the revised SERVQUAL scale, Wakefield and Blodgett (1999, 55) separates the dimensions of quality to intangibles (empathy, reliability, responsiveness and assurance) and tangibles. The tangibles are then divided into building design and décor, equipment and ambience for the purpose of servicescapes. Wakefield and Blodgett (1999, 56) postulate that the intangible dimensions influence perceived quality through the customer's cognition, while tangibles influence the customer's affective state. The variables of cognition and affect are closely related to Kotler's (1972, 54) postulation of information and affect that are described above. These two models are in contradiction for the ability of servicescapes to influence cognition. It is reasonable to assume, though, that servicescapes do affect cognition, as Kotler proposed, but the main focus is in the affective state, as per Wakefield and Blodgett.

5.2.3 A Framework of Servicescapes

Elements of servicescapes have been introduced earlier in this paper. Previous research revealed that while it is easy to accept several elements to be part of servicescapes (smell, signage, logos etc.), researchers have not agreed on a common listing of the elements. Perhaps more importantly,

the relative contexts of the elements have not been conceptualized. This research attempts to do so, using the concepts of previous research of which servicescapes are a cross-section.

An appropriate framework is found outside of the research field of servicescapes. Garrett (2006, 37) conceptualized elements of the user experience from the point of view of design. Originally applied to web site design in the context of information services, with modifications it is here applied to servicescapes. The model has five levels: surface, skeleton, structure, scope and strategy. On another axis, the elements can relate to either functionality or information (Garrett 2006, 36-37). The applied framework of servicescapes is illustrated below in figure 5-1.

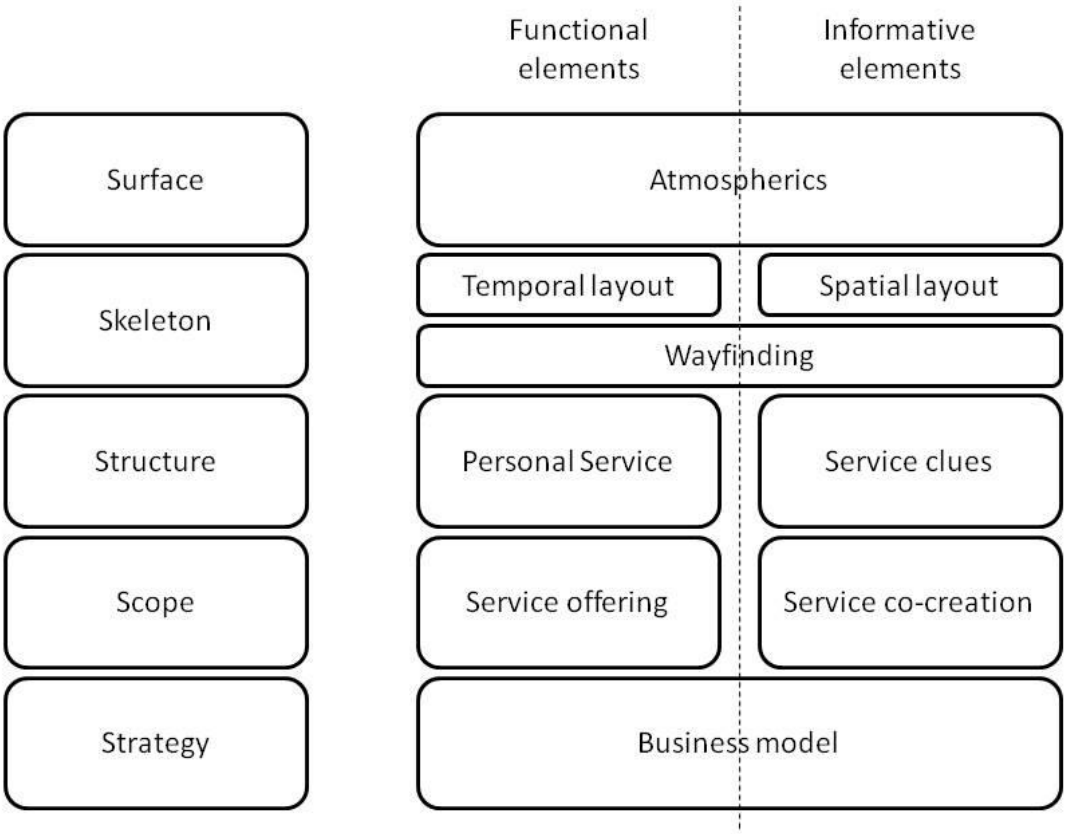

Figure 5-1 A framework of servicescapes, adapted from Garrett (2006, 37)

The following are summaries of Garrett's (2006, 37-39) descriptions of the elements of user experience. Upon each is a reference to which element of servicescapes it is compared to. Mirroring Garrett's model, some of the levels have clearly defined functional and informative elements while others relate to both at the same time.

The strategic level is the foundation of user experiences. Above all, it defines customer needs and the associated product/service objectives. It also defines the revenue model as a means of value generation to shareholders. The analogue of this level is the *business model*.

The scope defines the service on its most general level. Its functional elements include the service features and their specifications. In servicescapes, this element corresponds to the *service offering*. The informative scope of the service defines how service features communicate with the user, which relates to *service co-creation*.

The structural level is where the user experience begins to take shape. Its functional purpose is to design how the user flows from one task or stimulus to the next. This is the purpose of *personal service* in servicescapes. The informative purpose of the structure is to speak a language in the form of stimuli that the user understands, a task belonging to *service clues*.

The skeleton defines the user experience on a more specific level. As an element of functionality, it maps the flow of interaction and the touch points of the service. The schedules and sequences that define that flow can be dubbed the *temporal layout* in servicescapes. The informative purpose of the layout is to communicate available options to the user and to help access them, which is achieved with the *spatial layout*. Pertaining to both elements, the level features information design such as signage and visual cues, the relevant application of which is *wayfinding* in servicescapes.

Finally, the most superficial level of all is the surface, the realm of sensory design to create stimuli. Its definition is the same as that of *atmospherics*. The whole of these elements forms a taxonomy where every type of detail in servicescapes has a category.

Later in this research, the elements of servicescapes are compared against the innovation types defined earlier. The result is a grouping of the practical areas in which servicescapes can be developed in cruise ship design.

6 Cruise Operation and Shipbuilding

With generally applicable theory covered by previous chapters, the focus of the paper shifts to the cruise industry in chapters 6 thru 8. An exception to this is the topic of modularity in section 6.3.3, which relates to the challenges posed by the evolution of business models of cruise ships. First, section 6.1 provides basic information on the cruise industry, while the remainder of the chapter concerns change and competition in the industry.

6.1 Information on the Cruise Industry

The market of cruise operation is a consolidated one: Four cruise lines comprise 90% of all cruise ship orders (Parvinen & Molinare Kärki 2008, 13). The construction of cruise ships is equally centralized, as there are only three major players (Parvinen & Molinare Kärki 2008, 29): Fincantieri, Meyer Werft and STX Europe. The developer of the xpTray, STX, maintains customer relations with all major cruise lines, as it is customary and important in the industry (Parvinen & Molinare Kärki 2008, 13).

The shipbuilding business is worth $10bn per year globally (Barry Rogliano Salles 2008). Ship prices peaked in 2008 and have fallen sharply in 2009 (R.S. Platou Economic Research 2009), as new orders are scarce in the economic downturn.

STX Europe has gone through restructuring and change of ownership in recent years. The STX Group, a conglomerate, purchased a share of Aker Yards and the company changed names in the November of 2008. STX owns five shipyards specializing in cruise ships in Finland and France. STX and its predecessors have built the nine largest cruise ships in operation (Ward 2009, 144-649), not including the massive Oasis-class ships scheduled to be finished in 2009 and 2010. All except one of these eleven ships has been purchased by the Royal Caribbean International cruise line (Ward 2009, 144), so the cooperation of the two companies specializes in the largest cruise ships in the world.

The most important strategic issue besides product development in the sales/procurement process is financing; Parvinen and Molinare Kärki (2008, 17-18) state that for the cruise line to arrange hundreds of millions of euros for the purchase is the most difficult task in the process because of the risk involved. The sales process is not without risk to the shipbuilding company either: Parvinen

and Molinare Kärki (2008, 17) estimate that the cost of the two-year period of planning and negotiations in the sales process can cost the shipyard millions of euros.

6.2 The Industry Recipe: Change in the Cruise Industry

To fully understand the challenges faced by businesses in the cruise industry, the nature and speed of change must be known. Chapter 3 revealed the inner workings of business models, but how to assess the significance of change?

Andersson (2008) listed seven topical change forces in the cruise industry: (1) economies of scale achieved by larger cruise ships, (2) existing and new size limits in waterways, (3) rules and regulations, (4) emerging geographical markets, (5) evolving passenger expectations, (6) energy utilization and (7) social aspects of the cruise. An overview of these forces is that they are diverse, ranging from engineering capabilities to marketing orientation and on-board operations.

A more consistent variable to summarize in the analysis of change are organizations. A part of the theory used to define the business model of the cruise ship, Tikkanen et al. (2005, 792) describe that the managerial cognition of the industry recipe encompasses the beliefs that actors have the industry, driving action in business models. The question is: What is the industry recipe like?

A classic typology of a firm's view of itself and the associated actions is by Miles and Snow (1978, 14). According to them, competing organizations can be prospectors, analyzers or defenders. Prospectors are active in creating new value and seeking to grow in new markets, defenders are passive exploiters of existing market positions and analyzers fall in-between. Kellogg and Nie (1995, 324) provided a way to identify the three types with the Service Process / Service Package Matrix. The type depends on whether the organization's service process is an expert service, service shop or a service factory or whether the service package they offer is unique, selective, restricted or generic. Each of the processes and packages has strategic implications.

However, for the cruise industry, the results are mixed. The implications of flexibility and dependability posed by the different service packages (economies of scope, service package design, capacity management and economies of scale) are all identifiable as important aspects of the business. The strategic competencies demanded by different service processes (expertise and professionalism, encounter management, cost control and standardized procedures) are all essential as well in an experiential service of a highly competitive market.

The conclusion is that cruise lines have the strategic tendencies of prospectors, analyzers and defenders at the same time. This seems natural in a business where the pressure is both to create novel experiences and to avoid risks associated with multi-million euro ship purchases. As described in Wang's (2008, 330) research, cruise lines demand tradition, evolution and revolution from the ships they procure.

It does beg the question, though, of whether the matrix is outdated in an age of experiential services. Is it even possible for an experiential service company not to have the characteristics of a Prospector, even while they continue to compete on many of the cost-effective operations already developed in previous decades?

The conclusion regarding the cruise industry recipe is that change is significant but not very radical. Cruise lines don't have a testing ground cheaper than a whole cruise ship for revolutionary ideas, so a certain degree of tradition is maintained. As established in chapter 4, the desired innovation is of the sustained type.

6.3 Evolution toward Larger Cruise Ships

Among the change forces listed above were economies of scale and the related concepts of waterway limits and energy utilization. As of the beginning of 2009, the 27 largest cruise ships have been built during the last ten years, and the largest five in the last five years (Ward 2009, 144). The growth in size can be quick: The two Oasis-class vessels under construction have 42.5% more gross tonnage than the previous record-holders (Ward 2009, 682). Figure 6-1 illustrates the growth of gross tonnage in cruise ships constructed in the last 40 years.

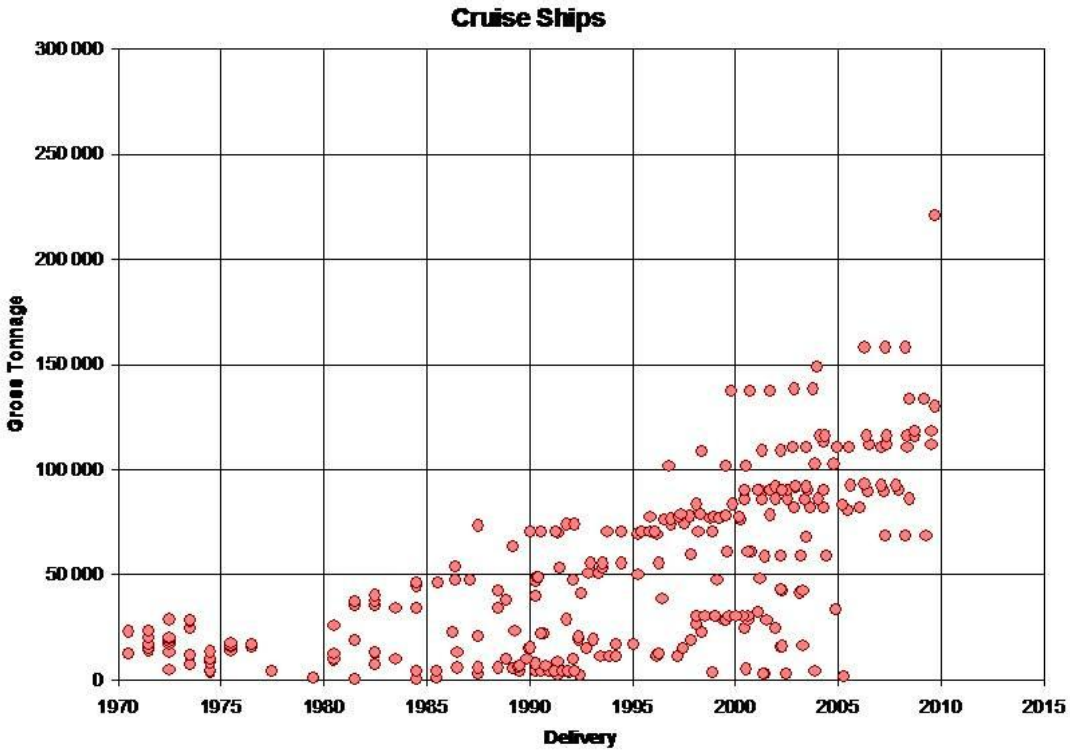

Figure 6-1 Gross tonnage of cruise ships, reprinted from Andersson (2008)

The development is not governed only by engineering capabilities but especially the realized benefits and market acceptance of larger ships (Eloranta, interview). Above all, this research focuses on the economies of scale as the driver of this development and seeks alternative approaches.

6.3.1 Economies of Scale of Cruise Ships

Economies of scale relate to a number of different cost drivers on cruise ships. Eloranta (2009) illustrates a logarithmic decrease of construction costs and energy consumption per passenger as gross tonnage grows, while Levander (2008) claims that the required number of crew members per passenger is subject to a similar decrease. The decrease is logarithmic, so these economies have their limits, although the size limits of waterways are likely the stricter constraint. Still, the cost savings have so far been significant.

Economies of scale can also be value drivers. Passengers are demanding of on-board service variety (Soinila, interview), which is easier to achieve in the layout of larger ships. Furthermore, potential network effects as proposed by Eisenmann et al. (2006, 96) exist, but as hypothesized, they are more likely to be negative. According to Ward (2009, 102), perceptions of crowding and impersonal service are more probable on larger cruise ships.

Yet the question is whether economies of scale are the correct effects being managed. Schmenner (2004, 339) revised his matrix and omitted the degree of labor intensity (related to economies of scale as crew to passengers ratio) as the relevant cost driver, replacing it with relative throughput time. The new variable isn't entirely relevant for the cruise industry, since the length of the cruise is fixed. However, capacity management issues and queues degrading the service experience are an issue. Getting the ever larger ships to embark and disembark is a logistical challenge. Ship size can increase embarkation and disembarkation times by more than 50% (Ajamil 2008), which incurs costs and badwill. Soinila (interview) concludes that perceptions of crowding happen especially during such operations, and the large size of ships raises such fears in passengers' minds. Logistical flows are a challenge inside the ship as well, but whether they are more cost-efficient for a smaller, simpler service offering or a larger offering with more pooled demand patterns is unclear.

In conclusion, the goal of economies of scale on cruise ships doesn't follow the cost-efficiency variables of Schmenner's (2004, 338) Theory of Swift, Even Flow in an ideal fashion. At some point coordination costs offset economies of scale. Also, regarding the customer experience, a high ratio of crew to passengers allows for more personal service. Ward (2009, 159) uses the ratio directly as a proxy for the quality of service, making it a value in itself.

6.3.2 Value Creation in the Cruise Industry

To better understand the evolution of business models in the cruise industry, an in-depth view on value creation is in order. As established in section 3.2.2, the cruise lines operate business platforms where value creation isn't exclusive to either passengers or on-board services.

Value of cruise ships as perceived by cruise lines

The first focus of analysis is the relationship between the shipbuilder and the cruise line. Wang (2008, 79-81) provides a typology of value sources, which allow the cruise line to operate a successful business platform:

1. *Technical quality*: The performance of the ship in a broad range of issues such as safety, reliability, automation and environmentalism.
2. *Functionality*: The capacity management of passenger flows in embarkation, during the cruise and disembarkation.
3. *Passenger volume*: The number and segments of passengers who can be taken on board, primarily determined by the number and value of cabins.
4. *Efficiency*: Covers efficiency in the use of limited space, energy utilization and the leanness of crew operation required.
5. *Personalization*: The theme of the ship and its available infrastructure for new services.
6. *Innovative features*: Compatibility with the cruise line's image.
7. *Specialized features*: Unique and novel features that service as marketing tools as well.

Wang lists a couple more value sources (revenue and profit, growth, strengthening the brand and passengers satisfaction), which were excluded from this listing, as they are effects of the above sources.

An interesting conclusion to be made from Wang's research on the industry is that crew operation has only been considered for its efficiency, despite that ship design influences crew operation in service co-creation. This implies that the ship design's role as an indirect source of customer experiences hasn't been properly addressed.

Passengers

Cruise lines commonly segment customers based on geography, age, family and income (Soinila, interview). The results are customer profiles such as baby boomers looking for relaxation or entire families looking for activities. Brands and offerings are sorted from the most expensive to the least expensive as luxury, premium and contemporary segments (Soinila, interview) with the option of separating low-cost offerings from the rest. The contemporary offering is aimed at a wide variety of segments, with entire families of all ages looking for activities at a reasonable price.

Cruise lines maintain a delicate balance between the pricing of admission and the rents or profit demand determining the pricing of on-board services. Changing the pricing balance between the subsidy and money sides of the market is a means of differentiation, although consumer acceptance leaves cruise lines with limited room for adjusting prices. Tradition rules, meaning that established core services are offered without additional charge, while new innovations often come with an attached price (Soinila, interview)

Even theoretically, the optimal pricing balance isn't quite objective. According to Wu and Liu (2007, 180), it would often be best for monopolies to charge different admission prices based on willingness to pay, and then adopt marginal cost pricing or non-linear pricing for services. A higher admission price is especially appropriate when transportation to the service area is costly (Wu & Liu 2007, 184), which is the case with cruises. Also, Eisenmann et al. (2006, 97) warn that attracting subsidy side users with inexpensive platform admission can be dangerous when variable costs are high, because these specific users can be very cost-conscious and not be good customers for the money side.

A degree of price discrimination can be accomplished in the cruise industry with different cabin classes, which can be used to attract specific segments. This approach has its limits: Pullman and Gross (2004, 569) discovered in a one-setting study that emotions relating to VIP treatment were found insignificant for the service experience. In other words, a mere classification of customers has a limited effect on the experience and on the willingness to pay by extension.

High prices on services may leave customers dissatisfied. Having already paid for admission, unexpectedly high costs of services may not seem just. Using the cruise industry as an example, Chase and Dasu (2001, 82-83) present key principles for staging experiences. Among other issues, they advocate getting bad experiences out of the way early and "combining the pain" so that unpleasant experiences occur on as few occasions as possible. Although the authors use the cruise industry as a positive example, extracting high prices for services would be in contradiction with these principles.

Considering the importance of admission pricing, it is contradictory that cruise pricing adjusts admission prices as a method of securing service revenue and markup. Are passengers more cost-conscious of admission, having incomplete information on the cost of services? Are the customer attributes in individual services better known and the service more easily adjusted than cabins, facilitating more accurate pricing? While these may be the case, the uncertain conclusion is that the

pricing of cruises is heavily driven by the competitive actions and marketing of cruise lines. These forces could sway prices far away from theoretical optima.

On-board services and itineraries

On-board services can be either outsourced or operated by the cruise line. Whether outsourced or not, the service offering as a whole has similar pressures: customer value creation and profit generation. They must add to the service experience of the cruise and be financially viable at the same time. Concerning the outsourcing of services, a conclusion is that outsourced services should either have competition on-board or the cruise line should have processes in place in order to ensure that the services provide good value at a decent price. Soinila (interview) states that the division between self-operated and outsourced services is largely made according to competencies; strength of brand wasn't mentioned as a factor.

There are few actual requirements for the content of on-board services. As per the classification of explicit and implicit services by Roth and Menor (2003, 149), they can be of either variety. However, since passengers have restricted access off board, many explicit services such as the satisfaction of hunger must be provided.

Concerning the strategic net of the cruise industry, the question is whether itineraries are a part of the net. Passengers leave the ship to go for services ashore. In some locations such as small Caribbean islands the service offering there may be targeted at cruise passengers, while near the ports of larger cities passengers may access services that would operate with or without this customer segment. Land-based services can serve either as substitutes or complements of on-board services. Their contradictory role could be better managed if cruise lines could have them join the two-sided market by extracting fees for providing customers. Soinila (interview) describes that building such linkages has a long and complex history, and success has varied

The importance of itineraries remains somewhat unclear. The cruise lines consider them important (Soinila, interview), and Andersson (2008) includes them in the cruise line's theoretical perspective of a cruise ship concept in development. On the other hand, in their empirical research of cruise passengers, Petrick et al. (2007, 8-9) found potential customers to appreciate not needing to decide on a holiday destination when going on a cruise, which implies indifference toward itineraries. However, the managerial cognition on the subject seems more diverse and longitudinal than the

interviews by Petrick et al., leading to the conclusion that itineraries and land-based services provide significant value in terms of variety and novelty.

Variety is the most central issue on the subject of the service offering. Passengers are demanding of on-board service variety (Soinila, interview); it has become a key marketing resource as cruise ship designs have grown in size. Why do passengers have such preferences, even when it was established that services are relatively highly priced relative to admission?

Like with pricing, the approach in the cruise industry defies certain theoretical conclusions. Gourville and Soman (2005, 382) postulate that in the case of a diverse offering, overchoice increases cognitive effort demanded of the customer and the potential regret a wrong choice would inflict. This is especially the case when products or services have both strengths and weaknesses compared to each other, which is true for experiential services.

A possible explanation for high service variety is the long, fixed amount of time passengers spend aboard a cruise ship. Whereas customers would be happy to save time in many services (even hedonic ones such as a beauty parlor), on cruise ships they must find ways to spend time. A common worry shared by potential passengers could be boredom, which is natural, since not all people have a good understanding of cruise experiences. Whether they are having a good time or feeling stale, more services to choose from could only improve their options.

A few alternative approaches exist for facing the challenge without simply adding new services. Firstly, the fear of boredom could be addressed with marketing efforts: Cruise lines should not just introduce services and hope that their totality is found diverse. Instead, a value-based or experience-based approach is needed in order to paint a comprehensive picture of an exciting cruise schedule in people's minds. Secondly, services can be adjusted over the duration of the cruise in order to increase variety, an approach previously introduced in the theory of servicescapes. Some of the means to achieve this are presented in the next section.

6.3.3 Modularity in Cruise Ship Design

Since the financing of larger ships is difficult and the size limits of shipyards and waterways place limits on the dimensions of cruise ships, what alternative approaches other than size are there to capture the economies of scale? An approach to increase the variety and value of space aboard cruise ships are facilities of multi-purpose use. For facilities to be suitable for multiple purposes,

certain standards, interfaces and flexibility are required. These can be achieved with the design concept of modularity.

Previous Research on Modularity

Modularity pertains to the use of modules in design. By definition, modules are subassemblies (Arnheiter & Harren 2006, 87) of products and consist of multiple components. Especially relevant are the interfaces between modules, as postulated by Sanchez and Mahoney (1996, 87) in their research on the strategic implications of modularity. As per Gershenson et al. (2003, 297) modularity aims to minimize the interaction between modules, making them easy to combine and recombine.

Modularity as a concept is applicable to many aspects of the business. Pekkarinen and Ulkuniemi (2008, 88) propose that modularity has dimensions in services, processes and organizations. The most relevant to this research are naturally modular services, in which Pekkarinen and Ulkuniemi (2008, 90) define the main purpose of modularity to be to facilitate the derivation of service offerings to different segments. In other words, the abstract modules that create value can be recombined to match the needs of the customer.

Modularity is known to several disciplines, the research of which isn't mutually linked in an inter-disciplinary fashion. This has led to a multitude of definitions and purposes as well as differences in focus and understanding. Table 6-1 summarizes the differences between four fields of research: design, marketing, engineering and logistics.

Table 6-1 Four different views on modularity

View	*Nature*	*Driver*	*Purpose*
Design	Descriptive	Consistency	Conformance
Marketing	Interactive	Competitive dynamics	Learning
Engineering	Sequential	Assembly costs	Combination
Logistics	Temporal	Demand uncertainty	Postponement

Baldwin & Clark's (1997, 86) view on modularity is popular in the context of design. It is a multi-faceted one, comprised of the concepts of architectures, interfaces and standards. Architectures define the chosen modules and their functions, interfaces enable the manner of interaction between modules and standards guide the modules' suitability for the system and their relative performance. The design view describes individual aspects of modularity rather specifically. Its contribution to modularity is the emphasis on conformance and the comprehensive attempt to identify all different aspects.

In marketing, modularity is used for learning and change (Sanchez 1999, 93), making it arguably the most strategic view on modularity. Sanchez (1999, 93) models modularity within the economy to consist of product, process and knowledge architectures as well as component interfaces. This view accentuates the interaction between architectures, where knowledge architectures mediate the interfaces between those of products and processes. Product offerings are the result of the interaction, which ultimately leads to new offerings, mediated by the organization's market experience and information. Sanchez (1999, 92) proposes that modularity benefits the organization with a faster time to market in product development, as well as more variety in the offering and lower costs. The conclusion based on Sanchez's views is that marketing is concerned with the competitive opportunities modularity can provide.

The engineering view of modularity can relate to many different disciplines: construction, mechanics, electronics or naval architecture, for example. From this point of view, modularity is especially relevant in the assembly process (Pitkänen 2002, 6-7). Production plans can be made with efficiency in mind. Depending on which components or modules to assemble in which stage of production, the goal of modularity is to minimize assembly costs. Laurinen (2008) states that modularity allows for parallel manufacturing in the ship industry (building the ship both inside and outside the structure), enabling shorter production lead times. This has further implications on the management of supply chains, as suppliers must match their replenishment service with the modular production sequence.

The fourth and final view is that of logistics. Logistics is mostly interested in product modularity, the where and when of assembling the final product. This postponement of assembly (Dornier et al. 1998, 252) defines the temporal dimension of modularity. Since demand patterns and final plans are uncertain, logistics is concerned with keeping options available for as long as possible. Randall and Ulrich (2001, 1589) explain the challenge with the concept of market mediation costs: Companies

are incurred inventory holding, and obsolescence costs as well as lost sales when supply doesn't match demand. With modularity, the exact offering can be decided on at a later stage.

Implications of Modularity for Cruise Ship Design

The shipbuilding industry can be considered to be dominated by engineering, largely due to the importance and required human resources of complex engineering solutions. For this reason, modularity as a concept is understood and applied with the engineering point of view (Pitkänen 2002, 28; Laurinen 2008). This runs the risk of leaving other functions and benefits without proper focus. The versatile nature of modularity is understood as a concept, but the focus and consistency of its implementation have much room for improvement. Eloranta (interview) describes the focal point to be in construction.

A survey presented by Laurinen (2008) reveals that the representatives of European shipyards believe construction to be the task or function which modularity stands to benefit the most. In the other end of the spectrum, the sales function and operating the ship are the two tasks for which modularity is considered the least relevant. This could be perceived as a shortcoming of the engineering view. For example, the sales/procurement process could greatly benefit from quicker design solutions, which is proposed to be an essential benefit by Sanchez (1999, 92). In other words, the marketing view has been ignored here.

Still, perhaps even more serious underestimation pertains to the operation of the ship by the cruise line. According to Pekkarinen and Ulkuniemi (2008, 88), modular services are visible to customers; in engineering, the view on modularity leaves it hardly a purpose in services to begin with. Furthermore, customer interface modules are used for service co-creation (Pekkarinen & Ulkuniemi 2008, 95), for example, the grouping of service functions at an information desk is used in the interaction between the operator and the customer.

The conclusion is that the shortcomings of the engineering view on modularity relate to ignoring modularity in use as opposed to modularity in design and assembly. One of the essential qualities of modules is stated by Gershenson et al. (2003, 297): Modules can be removed and replaced. This can be done for the purpose of repairing the product or modifying it with new features. Both purposes have uses in cruise ship design: Ships go through refits both to maintain existing functions and to add new features for variety and novelty. The same cure is useful for an issue presented by Voss et al. (2008, 259): One of the challenges of experiential services is that marketing strategies can be

volatile while investment periods in physical environments can be long. While facilities should still be providing income, the environment or managerial perceptions have already changed.

Also a common problem is that cramped spaces are difficult or impossible to modify and adjust for optimal utilization when demand patterns change (Voss et al. 2008, 259). Modular design in facilities could reduce refit times and costs, allowing for simpler changes in facilities. However, to truly allow for modularity in use, the facilities must be designed to be very flexible, with mobile walls, light furniture, versatile lighting and other functions. The multi-purpose use of facilities is the main goal of modularity in use in cruise ship design, and it will be the focus of this research. The appropriate design of facilities isn't possible without a holistic view on modularity, which follows in the next section.

A Framework of Modularity in Cruise Ship Design: an Amalgamation

The views of design, marketing, engineering and modularity are almost invariably considered separately in research, and rightfully so, as it allows for the research of simple theoretical concepts. In product development, however, it is important to consider all the possible views for the benefits they could offer. Figure 6-2 illustrates an amalgamated view on the relative roles of different concepts described above and renames the components in the context of cruise ship design. The model will later be applied to a single area of the xpTray ship in section 7.3.6.

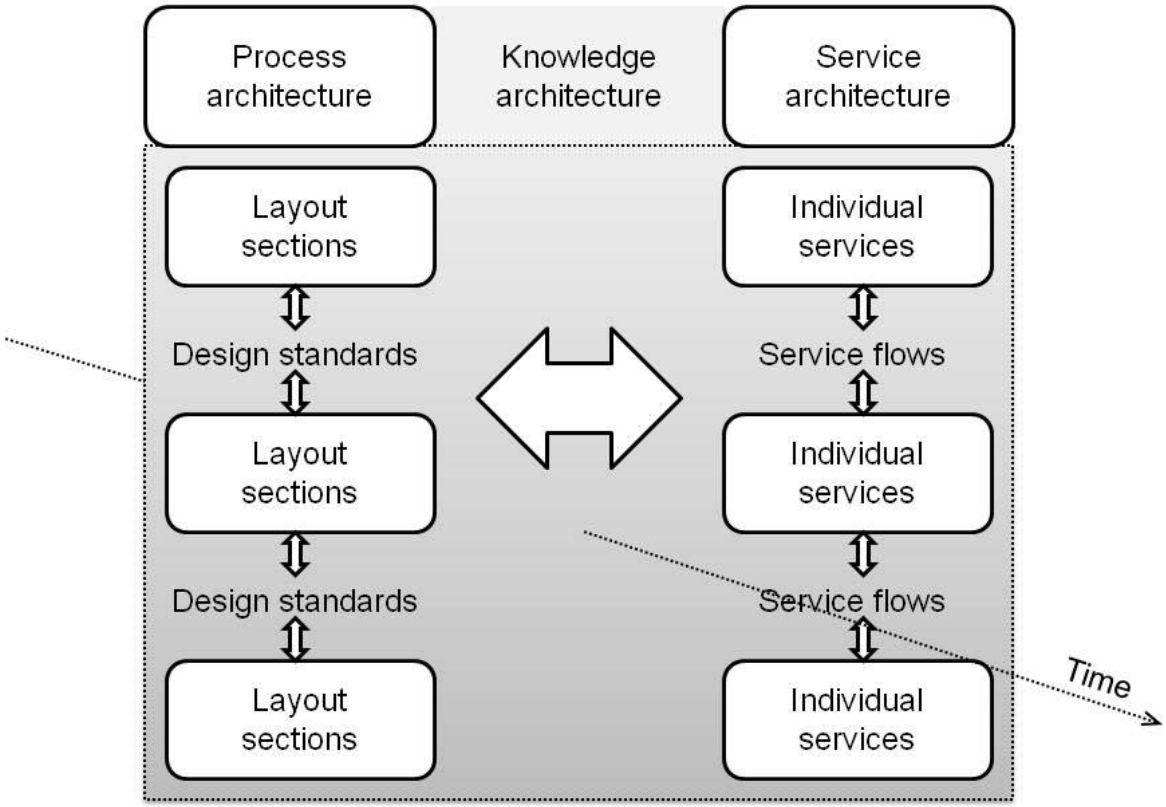

Figure 6-2 Modularity in cruise ship design, adapted from Baldwin and Clark (1997, 86), Sanchez (1999, 93) and Dornier et al. (1998, 252)

On the left is the process architecture. Although Sanchez (1999, 93) defined its components to be process activities, this model applies a view more resembling of the architectures of Baldwin and Clark (1997, 86), where they define them to govern subassemblies and their functions. Such modules are sections of the ship layout, which each serve as a facility for multiple customer experiences. These sections are made consistent and appropriate by design standards within the knowledge architecture, which ensure that customer experiences flow as planned when the purposes of these areas change over the duration of the cruise, as per the temporal dimension of modularity.

The service architecture lies to the right. Its components are individual services aboard the ship that complement each other. When the services are recombined over the duration of the cruise in a modular fashion, the knowledge architecture of service flows ensure that the customer experience is a desired one.

The interfaces within the knowledge architecture have been given a more specific typology by Sanchez (1999, 93). The following is their listing and an application to cruise ship design: (1) *attachment* refers to the walls and surfaces whose manipulation is crucial for modularity in use of multi-purpose facilities; (2) *spatial* interfaces are the floor plan; (3) *transfer* interfaces map the water and electricity infrastructure aboard the ship; (4) *control and communication* govern the scheduling of multi-purpose use; (5) *environmental* interfaces create the sensory experiences of the customer; (6) *ambient* interfaces control exposure to sunlight and the weather; and (7) *user* interfaces pertain to social interaction and the co-creation of services. These modular interfaces are critical for implementing mobile structures which allow for the multi-purpose use of facilities.

Quality of Modularity in Cruise Ship Design

A framework for assessing the effectiveness of modularity is found in research on quality. Arnheiter and Harren (2006, 95) use the dimensions of quality by Garvin (1987, 104-108) to list both positive and negative issues in which the use of modular design can result. Both listings were originally made without much consideration for services, but that isn't a problem, as cruise ship design, too, can only influence a limited number of service characteristics. Table 6-2 lists the positives and negatives of modularity in cruise ship design.

Table 6-2 Effects of modularity in cruise ship design, adapted from Arnheiter and Harren (2006, 95) and Garvin (1987, 104-108)

Dimension	*Positive impact*	*Negative impact*
Aesthetics	Consistency of design standards	Limited design options due to need for component interfaces
Perceived quality	(No obvious effects)	Overuse of similar modules around the ship
Performance	Variety over time in the service experience offering	Time-consuming and disillusioning re-purposing work on facilities
Conformance	Consistency in design of service facilities	Design know-how needed from service operators
Features	Capacity for a larger variety of service facilities	(No obvious effects)
Serviceability	Improved maintenance speed	(No obvious effects)
Reliability	(No obvious effects)	Fragility of mobile structures
Durability	Uncomplicated refits of facilities	(No obvious effects)

Some dimensions of quality mainly face positive or negative issues. Certain issues such as the training of service operators and the potential fragility of mobile structures can be addressed with more investments; others, such as the unsightly work done in an effort to modify a multi-purpose facility during a cruise, may do harm to their very purpose – the improvement of the service experience. Still, with successful planning and implementation, the benefits of modularity can be considered to outweigh the drawbacks.

Review and Provisions for Modularity in Cruise Ship Design

As a summary of the section 6.3.3, this paper proposes four main purposes of modularity in cruise ship design:

1. *Utilization*. An increase in service variety per gross tonnage requires the utilization rates of facilities to be higher. With modularity allowing for multi-purpose use and quick refits to reflect demand patterns, facilities may be used for other purposes when their primary service faces a quiet time either during or between cruises. Also, consistent design standards are needed for the modules to be appropriate for use.
2. *Design*. Both the process architecture (modules) and the knowledge architecture (interfaces) relate to the structure level of servicescapes, where physical clues are created to ensure consistent experiences. With standards governing the tangible and visible parts of facilities, service clues enable a consistent flow of experiences.
3. *Temporal layout*. Without modifiable physical environments, there is little that could be done to alter the customer experience over the course of the cruise. Modularity can facilitate easy changes in servicescapes in an effort to create variety over time.
4. *Cue and offering replacement*. When the ship requires profound design changes in-between cruises for novelty, modularity can cut the time and costs of refits with lean modules for facilities, cost-efficient production of components and standard interfaces for installation.

Although modularity was found beneficial for cruise ship design in the previous section, there are issues with implementation and application that must be considered. Firstly, Gershenson et al. (2003, 297) emphasize that simple units allow for diversity and variability. Complex units will not capture the benefits as effectively. Modularity is supposed to simplify interfaces between units, but modularity in use in itself can be so complex that staff training becomes more challenging and consumes resources. Multi-purpose facilities are definitely more complex than the conventional static design.

Secondly, modularity is difficult to implement consistently due to long life cycles in the cruise industry. Modular designs are likely to change during the long periods between the construction and refits of vessels. Ships which employ similar design and which are usually built in rapid succession (called sister ships) are generally so alike that their construction mostly enjoys simple economies of scale, not the ability to flexibly modify a modular design. Furthermore, the industry can't capture the full benefit of shortened lead times in product development because financing issues are often the ones that govern the progression of the process.

Thirdly, multi-purpose facilities can be costly to produce and operate. The additional consumer value created by the increased service variety is unlikely to cover the cost; an increase in utilization rates must be achieved for the design to be worthwhile.

6.4 Blue Ocean Strategy: Connecting Industry Recipe and Innovation

In section 6.2, it was established that the speed of change is of mixed types in the industry and that innovation is incremental. The final part of chapter 6 concerns the tools for the actions and innovation demanded by the industry recipe.

Blue Ocean Strategy a concept relating to innovation, presented by Kim and Mauborgne (2005, 107). Blue oceans refer to new market spaces where competition is weak. Such spaces are reached by differentiated products that target entirely new customer segments. As previously stated, such potential customers still exist for cruise lines. Blue oceans are worth seeking: A longitudinal study by Kim and Mauborgne (2005, 107) showed that product launches within blue oceans have a must greater profit impact than their counterparts with less differentiation.

Kim and Mauborgne (2005, 113) propose the Four Actions Framework for reaching blue oceans. The framework provides four measures: (1) *eliminate* components of value that are unimportant and perhaps taken for granted previously; (2) *reduce* the scope and factors that have been over-designed for too much assumed value and cost; (3) *raise* the factors in sources of value where compromises shouldn't be made; and (4) *create* factors for new sources of value.

The framework enables simultaneous differentiation and cost leadership strategies (Kim & Mauborgne 2005, 117). This is important for any tool applied to the cruise industry, as the change forces were found to emphasize both economies of scale and the customer experience. As the Four Actions Framework analyzes a single product or service in detail, it is best used for analyzing the ship as a whole.

7 Cruise Ship Design Innovation: the xpTray Design Concept

The focus of the empirical part of the thesis is the xpTray design concept. Firstly, chapter 7 introduces potential applications and effectiveness of innovation in cruise ship design. These concepts are evaluated with the xpTray in mind, and they are a result of ideation within the xpTray research project team. Secondly, the final recommendations for the design concept are presented in chapter 8.

Once the text proceeds to individual recommendations for cruise ships in section 7.3, observations and taxonomies made for business models and servicescapes in chapters 3 and 5 are put together in order to define the scope and groupings of innovation. The key issues are then cropped and presented in chapter 8 for the xpTray, completing the case study.

7.1 Introduction to the xpTray Design Concept

The xpTray cruise ship is a design concept in the earliest stages of product development. The general goals and guidelines of design are still yet to be set in stone. Their appropriate design is the key goal of the research project.

The xpTray design concept was created before the beginning of the thesis project. As a result, its design had some pre-existing guidelines: ship size as well as the general shape of cabin and service areas, for example, and a recommendation to research applications of modular design. No strict restrictions were set, though.

On the exterior the xpTray, pictured in appendix 1 by Ahola (2009), is a radical change from conventional cruise ship designs of its size. Typically, a cruise ship of its size would have service areas around deck 5 as well as on the top of the ship, where the skies open to the sun deck. A typical cruise ship would be roughly equally wide on all decks in order to minimize height per volume.

The fundamental change in the case of the xpTray is to place the sun deck on the lower decks, where nearly all service areas would be centralized. The sun deck needing an open sky, the superstructure (deck 9 and above) must be more narrow than the hull (deck 8 and below), so that the deck goes around the superstructure. This creates a “tray” which is slightly wider than the hull. Both the tray and the superstructure give the ship design a unique look. Narrow, high and situated above hollow service areas, the superstructure is an engineering challenge, but it offers to possibility to

equip all cabins with windows facing the seas. The top of the superstructure has a small area that can be made a public space as well.

7.2 Effectiveness of Physical Environment Design

Previous chapters have introduced concepts in servicescapes that could be put into use in cruise ship design. It could be said that servicescapes are to experiential services what cruise ship design is to cruises. The question remains, to what degree can the measures cruise ship design influence the value of cruises? This is evaluated in the light of two different competitive strategies: Differentiation and cost leadership.

Differentiation pertains to the customer experience in servicescapes. Previous research has been inconclusive on the subject. Studying cognition, Bitner (1990, 79) found that physical surroundings were found important to the customer's subjective understanding of the situation, whereas in behavioral research, Pullman & Gross (2004, 570) concluded that connections of the physical environment to loyalty behaviors were inconclusive.

Lobo (2008, 7-8) extended quality research to study the cruise industry. He used the renewed SERVQUAL scale to discover that tangible factors have the smallest quality gap of all five factors between perception and expectations, meaning that the tangible environment has the least to gain from improvements. It also has the least impact on overall satisfaction. However, Lobo's research should be criticized as unfit to evaluate servicescapes, as he used only two questions to assess the tangibles: Whether the cruise line has a modern fleet of ships and whether the ambience and décor were attractive. These questions were used to study cognition rather than affect. Previous research, introduced in earlier chapters, states that servicescapes are much more than Lobo's scale and tangible factors mainly impact the affective state, rather than cognition.

The inconclusiveness of research leaves cruise ship design's power to influence customer directly rather unknown. In any case, the design of physical environments affect employee roles, and through them, the service experience. There is sufficient reason to believe that the individual measures found important for experiential services are important in the case of cruise ship design as well.

In terms of cost leadership, the benefits are simpler and easier to quantify. Consistent with the drivers of business model evolution, design of the xpTray can achieve savings in materials

(construction), weight (operation) and premises (outfitting). On the flip side, the demands which experiential services put on personal services may increase personnel costs.

7.3 Innovation Types in the xpTray Design Concept

Section 3.2.3 introduced a typology of innovation. With the xpTray, the focus of innovation is in physical environments and the service offering. Other types of innovation are not so relevant for cruise ship design (e.g. marketing channels) or they are outside the scope of research (e.g. on-board inventory management).

Using the framework of servicescapes introduced in section 5.2.3, table 7-1 extends the typology of innovation in mature markets to present the focus of each type of innovation.

Table 7-1 Innovation types in the xpTray design concept, adapted from Moore (2005) and Garrett (2006, 37)

Innovation	*Subject*	*Servicescape*	*Focus*
Line extension	New ship	Business model	Positioning
Experiential	Ship design	Spatial layout Temporal layout Wayfinding	Layout
	Service offering	Service offering Service co-creation	Experiential content
Integration	Interior design themes	Atmospherics	Design themes
	Service experience flows	Personal service Service clues	Clues and touch points
Value engineering	Utilization	n/a	Modularity

These focal points of innovation are presented in the subsequent sections, from the strategic level of servicescapes all the way to the surface level. Finally, modularity is presented as another focus of innovation, although it has no clear counterpart in servicescapes.

7.3.1 Innovation: Positioning

In the case of cruise ship design, positioning is a strategic level component of servicescapes and a line extension innovation. The key issue of positioning is the target market of the ship, which concerns the passengers and locations of the cruises.

The xpTray would be designed to operate mainly in the Caribbean in the winter, possibly relocating to the Mediterranean in the summer, serving the large contemporary segments. Soinila (interview) and Eloranta (interview) both estimate that a ship as large as the xpTray couldn't afford to target fewer or smaller segments than customer of all ages and moderate income. All the other ships of its size sail under the Royal Caribbean International brand, serving the contemporary market. This makes it important to maintain service variety.

The Freedom of the Seas cruise ship, finished in 2006 in the Turku shipyard and registered at some 155,000 GT, is the best option for a point of comparison. The xpTray could be built at its size or the size of the previous generation (Voyager class), but the newer design and services of the Freedom class are a better example of the competition faced by the xpTray. Both ships are intended to serve the same market. Below, the new design and offering of the xpTray are presented with the Freedom of the Seas in mind, with its strengths and weaknesses relative to the older ship.

In figure 7-1, the Four Actions Framework summarizes the dimensions along which the xpTray is differentiated from its competition. The most important variables are listed below in the eliminate-reduce-raise-create grid.

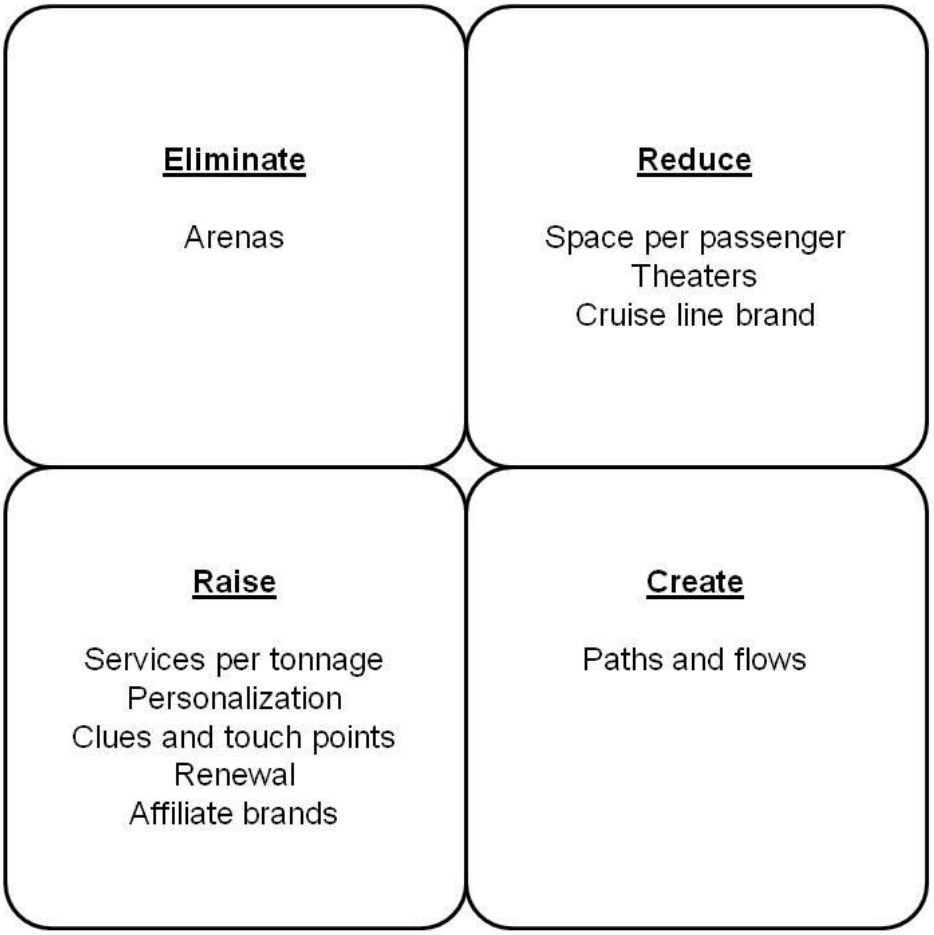

Figure 7-1 The Four Actions Framework of the xpTray Design Concept, adapted from Kim and Mauborgne (2005, 113)

Reaching the targets of the framework is no simple task. Most of these goals lack objective criteria for estimating the degree of change. The aim of the following sections is to introduce the measures for reaching to goals and justify their appropriate use.

7.3.2 Innovation: Experiential Content

Experiential content is a scope level component of servicescapes and an integration innovation. It refers to the individual characteristics of services, and for this reason it is difficult to define universal criteria for content. What makes a service experiential? Can the intensity of the experience be measured?

One such attempt of defined criteria has been made by Poulsson and Kale (2004, 274) in the form of the Experience Scorecard. The scorecard would describe experiential services along five variables, which would reveal whether specific types of services succeed in capturing all the facets of providing experiences. Based on the variety of literature on customer experiences, the scorecard could be extended to include a couple more variables. Below is a listing of the relevant criteria:

1. *Novelty*. For an experience to impact the customer, it needs to feature something new. Poulsson and Kale (2004, 272) define novelty as a change in stimulus conditions from the previous experience. As it pertains to stimuli, not reactions, it is reasonable to assume that the basic concept of the service (rather than the subtle nuances managed through reactions) must offer novelty.
2. *Surprise.* Relating to novelty, the element of surprise can be achieved only by knowing the customer expectations (Poulsson & Kale 2004, 273). Only then can the stager offer something unexpected and exceed expectations.
3. *Engagement.* Poulsson and Kale (2004, 273) summarize that engagement describes the interaction between the stager and the customer. Personal communication allows the experience to be continuous and flow from one stimulus and reaction to another.
4. *Personal relevance.* Some experiences, like the games of a favorite sports team, have an inherent personal relevance (Poulsson & Kale 2004 272), possibly irrespective of the staging of the service. Naturally, this can only be achieved by targeting the right customer segments – for cruises, it is the itineraries, marine themes or other experiential elements on offer on land as well can provide this personal element.
5. *Mutability.* Metters et al. (2006, 105) describe a connection between personal relevance and customization: For the personal meaning to manifest itself, often the customer must be able to create their own environment for the experience. The authors call this element mutability, based on the ability to ignore certain aspects of the service.
6. *Community*. In their research of experiential products, Gentile et al. (2007, 398) find that the customers of certain brands communicate with each other to form a community. The prolonged time spent on a cruise with the same passengers offers a chance for the stager to build communities.
7. *Learning.* Learning can be an integral part of an experience, as the new knowledge or skills serve as a way to relive the experience later on. Poulsson and Kale (2004, 273) propose that learning potentially reinforces perceptions of engagement.

8. *Dynamism.* This criterion serves to define the temporal context of the experience in all its forms. Metters et al. (2006, 108) describe three ways for this manifestation: Prolonging the experience with memorabilia, changing the experience as the customers gradually open themselves to it over time, and orchestrating the pattern of climaxes and calmer situations. In cruise ship design, dynamism can be achieved with facilities that change over the length of the cruise, and it can be used to renew the experience.

The implementation of the scorecard, however, has major weaknesses. Firstly, the grading of individual services can be difficult. Even Poulsson and Kale (2004) didn't attempt to form a questionnaire to assess their variables. It is difficult to find people with such diverse experiences that their answers were applicable to anything but one specific service at one specific time. Secondly, even with appropriate results, the implications are unclear. Should a service capture as many experiential components as possible? Is the experience with the most components the best? Can some experiences thrive on a single component alone? Lastly and perhaps the most importantly in the case of cruises, should a set of different experiential services be balanced to include all components or optimized to focus on a smaller number of them?

Still, certain conclusions can be made from the current business models of cruise ships. The newest ships feature facilities and services the likes of which have never been seen before on cruise ships. The ice rinks of the Freedom class and the merry-go-rounds of the Oasis class are examples of features tailor-made for marketing. Their case illustrates how the dimension of novelty could be emphasized over other experiential qualities. Conversely, it could be said that a ship design can't be ruined by leaving out a "must-have" service, as novelty is what sells.

As such, the best use of the scorecard is to identify the ways in which individual services provide experiences. The ideation can lead to ways to improve the experience. Later, in chapter 8, it is demonstrated how existing services could be improved by what were identified as the most important aspects of experiential services: Personalization and touch points.

7.3.3 Innovation: Clues and Touch Points

Clues and touch points are a structure level component of servicescapes and an integration innovation. Clues govern where and when customers encounter stimuli and how it affects their behavior.

The influencing of passenger behavior is one of the key goals of the xpTray design and particularly evident in passenger flows. The intended behavior is that people would move around the ship as individuals, not as masses. Conventionally, the situation is that the vast majority of customers spend parts of their day in the same place: the sundeck in the early afternoon, bars and lounges in the evening (see appendix 2 for observations on utilization). This leaves spaces crowded or deserted, both of which can ruin the atmosphere of an area. If people chose their preferences more individually, this would alleviate the problem and make it more natural for people to customize their daily activities to their liking. The ship design should encourage more variance in how they prefer to move around, if they should move at all. Ways to achieve this are presented in sections 7.3.4 and 7.3.6.

As proposed earlier, personal service is crucial to experiential services and a way to manage the reactions of customers, providing further stimuli as the touch points of the service. To make the service more personal would require more of the crew's time and for them to know more about the individual customers. Such arrangements have already been developed for cruise ships, as the same service personnel attend to the same cabins and dining room tables (around which passengers have predefined seats). In other words, such grouping of passengers to match service personnel is possible when passengers have fixed positions. Since it isn't appropriate to force passengers to fixed arrangements or areas more often than necessary, this aspect of personal service shouldn't be attempted to improve with ship design.

Other small-scale initiatives to bring crew and passengers to closer contact are in order, though: For example, service points should be designed in such a way that personnel can spend their idle time and contact with nearby passengers. Being designated to stand behind an information desk or a bar at all times is of little benefit to passengers.

The nature of service clues is very diverse. They could refer to any kind of items, décor themes or communication pertaining to the cruise. As such, they relate closely to other categories of innovation, e.g. design themes in section 7.3.5 or personalization, referred to in various sections of this study. Generally, clues should be present in all experiential contexts of the cruise. Although it is possible to overdo clues and be too intrusive, in the case of cruises a larger number of clues are often needed to add to the diversity and excitement of a multi-day cruise.

7.3.4 Innovation: Layout

Layout is a skeleton level component of servicescapes and an experiential innovation. Typically, the layout of a cruise ship is presented to the customer in the form of a floor map (spatially) and a cruise schedule (temporally). The ship's layout affects many different aspects of its design: Paths, area sizes, the scheduling of multi-purpose facilities, information channels and wayfinding.

Paths relate to the flows presented above. They are the routes which passengers have to or tend to take when moving between areas. In many cruise ship designs, paths are considered a necessary evil when every facility can't be right next to one another. There is an underutilized positive approach, though. When identified, paths can be used to create a consistent experience. If passengers, for example, want to go shopping after an early afternoon show and then drop by to a relaxing café afterwards, they should be given the stimulus to do so by placing these services along the typical path. These consistent flows can also be created using design themes. Art is typically placed in corridors and stairways to provide stimuli in otherwise uninteresting spaces, but they may be nothing but individual pieces. By putting together a consistent exhibit and the proper information to help as a guide, a similar investment creates a flow of experiences.

Paths often rely heavily on signage, lest their purpose go unnoticed. A special example would be a jogging track, which is placed at the sundeck in many new ship designs. Essentially, it is just a lane painted to the floor with sufficient space for running. Many other ships might have equally sufficient space on their decks, but without any signs pointing out a jogging track, no one would use the space for the purpose.

In addition to the relative placement of facilities, adjusting their size is a way to affect the layout. Scattered areas are a way to break down passenger flows into smaller crowds (as in 7.3.3). If many areas exist for sunbathing instead of a single, concentrated sundeck, there are more options (and possibly a shorter distance) for where to go for a tan. This increases variety for facilities aboard the ship, as the different areas have different atmospheres.

This practice has its upsides and downsides. Splitting areas into many fragments may either increase or decrease crowding. For example, people may prefer smaller crowds and perceive a 100-person sundeck less crowded than a 1,000-person one if they are both at 70% utilization. On the other hand, since capacity is no longer pooled, individual areas reach maximum utilization more easily. Also, the pooling of resources is important in the case of service personnel, who face more relative variance in demand in smaller crowds. Still, the xpTray is a rather large ship design, so it would have a considerable number of passengers for creating economies of scale. Smaller scales are

not all bad, as e.g. bartenders stand a chance to serve the same people more often and therefore offer a more personal service.

Furthermore, fragmented areas would influence atmospherics, e.g. with noise easier to block out. In the case of the sundeck, the atmospherics of the tray design are what make multiple sunbathing areas possible in the first place: Exposure to sunlight is only accessible on top of the superstructure in conventional design, but on the xpTray, all areas of the top tray deck are virtually equal in that respect.

For wayfinding, the tray design is superior to existing designs. With all service facilities situated in adjacent areas on the tray decks and with all cabins alone in the superstructure, the locations of available services are in a simpler arrangement and the distances between them are shorter. Along with the benefits to passengers, this should reduce the need for elevator capacity.

Related to wayfinding, information channels are crucial to the availability of services as well. Mere one-page brochures for each day of the cruise distributed to cabins aren't optimal for encouraging passengers to explore their options. A simple improvement in public areas would be to replace static signage with screens.

Ahola (2009) observed that potential customers would appreciate multimedia experiences as their preferred information channel. Cruise ships with xpTray's service level already have televisions in all cabins, so a potential channel already exists.

One of the main challenges of information channels is intrusiveness. Passengers often wish to relax and not be disturbed by push-oriented information. Typically, overuse of the ship's intercom is a nuisance. The conclusion is that an omnipresent, immutable information channel is the worst option, while localized push information such as tablets is fine. Of course, the best option would be to have such interesting and easy-to-use content that the use of pull-oriented channels was widespread. In the future, cabin-based Internet or intranet access could provide opportunities for a very flexible pull-oriented information channel. For the hardware to be worth the cost, further uses for it would have to be developed, such as social media applications between the passengers.

Finally, scheduling, the temporal layout of the ship, would be more complex on the xpTray than in the case of conventional ship designs. The availability of all public facilities and changes in multi-purpose use facilities is governed by both operational necessities (such as cleaning) and demand (no beauty salon services during the night). The multi-purpose use facilities are the cause of new challenges: How to change the functionality and the atmosphere without a break in the service?

How to secure and schedule employee resources to do the work? Ahola (2009) provides examples in his work of how to design multi-purpose facilities in effective but sufficiently simple ways.

The basis of facility scheduling is in their utilization. Functionalities of multi-purpose spaces must naturally be available at the hours when they are in demand. A study of utilization aboard the fully booked Vision of the Seas cruise ship (appendix 2) represents typical passenger behavior aboard a contemporary cruise and is therefore assumed comparable to the xpTray. The observations reveal large shifts in utilization between every few hours. At all times different facilities have considerable available capacity, which is to reduce the perception of crowding. The xpTray would need to have such extra capacity as well, but the aim is to reduce it without weakening service quality. Facilities devoid of fellow passengers are rarely of value to anyone, as the presence of people is crucial for the atmosphere.

7.3.5 Innovation: Design Themes

Design themes are a surface level component of servicescapes and an integration innovation. They refer to the consistencies in the superficial details of the ship, especially outfitting.

Only a few points can be made about preferences in design themes in the context of managerial research. The first is to use themes that are of personal relevance to passengers: Often such themes refer to geographical locations or eras of the past. For example, a Roman-styled restaurant could bring up memories of past vacations or a retro-themed bar referring to their youth. Additionally, a theme with guaranteed relevance on a cruise ship is the marine theme. The FlowRider surf simulator installed on some of the newest ships has received widespread media attention (Eloranta, interview) although such attractions already exist on land. Surfing aboard a ship is obviously a very different experience.

A different potential use of theme elements and atmospherics would be to combine them with signage. Touchable or scented points of information would create more stimuli concerning different services: Quiet speakers with the music of a night club or touchable miniatures of greeneries would encourage passengers to try the service.

The design themes of the xpTray are further described in the research of Ahola (2009).

7.3.6 Innovation: Modularity

Modularity is not a component of servicescapes, but it is classified as value engineering innovation and highly relevant for the xpTray. Section 6.3.3 introduced the amalgamated framework where the architectures of processes, knowledge and products define the focus points of modularity over time in cruise ship design. The following is a description of how the modules could interact according to specifications.

The primary shopping area near the middle of the lowest tray serves as an example of how modularity works on the xpTray. Appendix 1 illustrates that the area is divided by pillars or arched wall sections into an open space in the middle and bounded spaces along the sides. The bounded spaces alone aren't large enough to accommodate the entire business of retail stores, café's and other services. With mobile equipment like tables and racks, the services make use of some of the open central space.

Such clusters of services in direct interaction with each other are layout sections within the modular process architecture. Their use is enabled by the design standards of the knowledge architecture: Services can extend their reach outside of the bounded area only if the general design of the area is compatible with their visual design. This is accomplished by having the area look more urban than the shopping areas of conventional ship designs, allowing for more diversity.

The individual services exist as modules within the product architecture. They branch out to the open space, creating the knowledge architecture component of service flows: Customers move seamlessly from one offering to another, browsing racks for clothes or freely choosing a table to sit in the area when served from a single café. Simple as it may sound, this is rather rare of ships: Conventionally, services have their space strictly defined and bounded, interrupting the flow between them. By reaching out to the open central space, their provide stimuli for passers-by even before they choose to try out the service.

Finally, modules have a function in the shopping area over time as well. Retail and other services are designed to be quite randomly placed within the area, giving more options when the services are redesigned. A shopping street need not necessarily replace a retail store with another one. If cafés prove more popular over time, nothing in the general design prevents increasing their number. Measures of capacity management can be taken very flexibly within the central area, where the area size allocated to individual services can be altered daily.

Besides the above example, modularity was defined to have a purpose in service co-creation. Such solutions already exist: For example, a central information desk where passengers can bring up any of their troubles is generally considered an important service aboard cruise ships. In this case, the components of different information and problem-solving services are assembled into a module with a simple common customer interface. Generally, such improvements can be made in the field of cruise operation when crew members (the modules) are given information and training (components) to solve more of the customers' problems without a need to contact another crew member (within the same interface).

In summary, chapter 7 introduced the possibilities of improving servicescapes with cruise ship design. On a number of occasions, different types of innovation referred to dependencies with other categories, which illustrates that the concepts are highly intertwined.

8 Propositions and Financial Analysis of the xpTray Design Concept

This chapter reviews the recommendations that are made for the xpTray design concept. It is in the format of Magretta's (2002, 90) two tests of the business model. Firstly, the narrative test comments on the customer value of the business model. It provides the reasoning that the components of the business model provide the right kind of value consistently. Secondly, the numbers test comments on shareholder value, justifying that the business can be operated with appropriate financial burden and profit.

In essence, chapter 8 is an overview of the case study, providing answers on how to design a better environment for experiential services based on theoretical findings. Much of the justification for these decisions is made in section 7.3, with their context illustrated by table 7-1.

8.1 The Narrative Test

The narrative test seeks to answer some of the basic questions of business models. Does the plan work? Is the offering desirable?

Design choices in the case of cruise ships have significant impact on other characteristics of the ship, creating servicescapes and setting physical limitations among other things. A particularly influential decision is the total service design: Which individual services should be included on board? In section 7.3.2 the Experience Scorecard tool was introduced as a way to evaluate experiential services. However, it was also described that the tool was next to unusable for the reasons of not having an audience of respondents to evaluate the generic services of the xpTray and the inconclusiveness of the results. This leaves only the option of using personal judgment when filling the scorecard, but the conclusion of this research is to note that an objective way to test experiential services still under development is missing.

The general arrangement of the xpTray in appendix 3 (Ahola 2009) illustrates the extent of services chosen to be included in the design. As a whole, the design concept doesn't bank on entirely new services, but rather the assortment of more conventional services in a new environment, which draws inspiration from urban servicescapes.

Novelty, emphasized in section 7.3.2, is manifested in communicable ways. The tray design is revolutionary, perhaps even excessively so, and certain to draw the attention of potential customers.

Secondly, on the tray there are areas arranged in completely new ways, like a park area extending to the sides of the ship. Illustrations in appendix 1 (Ahola 2009) show how the interiors can be made look completely different from existing ship designs and pictured in advertising.

Services that are already familiar to cruise-goers have considerable room for improvement. Table 8-1 describes two developmental steps for traditional services: Touch points and personalization. Earlier in this research these two concepts were raised above the others as cornerstones of experiential services.

Table 8-1 Service improvements of the xpTray

Old service or clue	*Improvement in touch points*	*Improvement in personalization*
Restaurant menus	A centralized service point for introducing dining options	Cookery and tasting at the service point
Shows performed on stage	Small performances in random, central facilities such as corridors and lobbies	Eliciting interaction between performers and passengers for influencing the content of the performance
Art displayed in various facilities	Coherent exhibits in the form of marked paths and guide booklets for the artwork	Pre-cruise online signup for information on preferred exhibits
Concentrated outdoor seating areas	Smaller, scattered park areas with seating	Signage to encourage arranging activities like picnics in the areas, as well as the needed equipment
Information desk	Offering information together with other services such as food and drink giveaways	Open service point where employees can move around to connect with passengers during idle time
Pubs	Removal of walls to share bars with other activities like pool areas	Interior design themes with relevance in customers' lives (e.g. retro themes)

The above serve as examples of more experiential services and service clues. Not all services aboard all cruise ships are still in their most basic form – for example, chefs have already made public performances revealing how the night's dinner is prepared. However, the proposition

remains different, being a point of information in continuous service. Only this version provides consistent changes in touch points and personalization, not just in experiential content.

The art exhibits are by nature a solution to an existing problem: How to make the most out of the art adorning hallways and other public areas? Thinking services to be in the form of a path is a solution to the problem. Another example of problem-solving is unexpected small-scale shows: How to be rid of the underutilized main theater and still provide the same value? Small performances aren't the same thing as large-scale productions, but the latter are so commonplace aboard cruise ships these days that a more personal show can be justified to offer at least equal value.

Retails services play a significant role in the urbanization of the servicescapes. The xpTray project affiliate, Royal Caribbean International cruise line, provides retail (and restaurant) services under their own brands like *Sorrento's* for pizzerias or *Electronics, Inc.* for small electronics. The shop names are consistent over different ships, but naturally, such sub-brands are very weak compared to land-based organizations. In order to make the most out of building the brandscape, the xpTray should feature more outsourced brands in retail. For the cruise line, it would mean giving up on the opportunity to strengthen their own brands, but such has been the trend in retail environments like apartment stores for a long while.

If the seaborne environment proved too difficult for outsourcing partners to handle, the cruise line could negotiate to become a franchisee and bear the risk of operations. On average, it isn't worthwhile to attempt collaboration with companies famous for their lean operations and logistics, which they can't efficiently practice through ports at irregular intervals. Brands that rely more on higher markups are more effective in cruise ship environments. Furthermore, services that can support the experiential aspect should be given priority, like bookstores that run like a café or a lounge, featuring visits from authors.

The shopping area presented in section 7.3.6 is an example of the uses of modularity in the xpTray design concept. While most, if not all, of the areas of the ship are meant to have multiple purposes, there are four combinations where multi-purpose facilities are meant to save a significant amount of space: An outdoor party area where the pools turn into a nightclub after dark; dining areas that can be cut off from the dining room, usable as conference rooms between meals; a pub with card and board games as well as a cigar assortment; and lastly a lounge wrapped around the largest stage aboard the ship, permitting in part the main theater to be omitted from the design. These spaces are planned to provide the same value as the facilities of their respective functions individually, requiring a slightly more complex design in operation as a downside. Utilizing the public space of

underutilized facilities provides the resources to include less public space per passenger than in conventional ship designs.

Appendix 4 features a so-called service matrix used to evaluate all the possible combinations of multi-purpose spaces. The right-hand side has numbers to indicate a match in interfaces with possible value to be delivered, whereas the left-hand side, marked with small dots, includes only realistic options iterated from the earlier phase. The options actually chosen for the xpTray have a colored background.

All these multi-purpose spaces require modular solutions to work appropriately, much in the same way as the shopping area. The four purposes of modularity proposed in section 6.3.3 are fulfilled: The multi-purpose space solutions gain their resources from increased utilization and their use at different times of day alters the experience over the duration of the cruise, whereas the shopping area example described how to consistent physical clues and flows must be ensured and how the design facilitates refits when services are changed.

The layout of the xpTray enables improvements in the basic qualities of experiential services. As previously noted, the tray design is superior in reducing distances and corridors, having passengers move through areas of higher service value. Fragmented areas (especially for sunbathing) and facilities with different purposes at different times balance the flow of passengers. The scattering of areas can also be used to limit the working area of crew members, increasing the potential for personalization. The layout of the ship was created in collaboration with Ahola (2009), whose work includes a description of how attractions at the ends of open spaces create paths with experiential stimuli along the way.

Information channels aboard the ship benefit from the availability of new low-cost technology. Flexible signage can be implemented with screens, allowing for more stimuli. Television channels can be used to reach out to cabins with new touch points to services. Multi-sensory signage, as described in 7.3.5, is a way to build a more comprehensive image of services and areas in passengers' minds.

8.2 The Numbers Test

Measuring the financial viability of cruise ships is a daunting task. The cost of the ship requires complex calculations and re-calculations as designs change. The payback period of the investment

is many years, and return-on-investment calculations require a time span of over ten years to be viable. In that time, the operating environment will have changed, and the ship's revenue potential becomes dependent on refits, let alone the marketing actions of the cruise line. Nonetheless, the STX Europe shipyards have created tools to calculate both the construction cost and cash flow potential of a ship. Within the parameters of these tools, this research simulates the multi-purpose space solutions of the xpTray on an existing design of comparable size, the Freedom of the Seas vessel.

The purpose of this thesis is to calculate the financial impact of public spaces aboard the ship. Within the scope of the xpTray research project, the technical thesis by Bergström (2009) analyzes the technical construction solutions and their viability.

In the partnership of STX Europe and Royal Caribbean International within the last 15 years, new ship classes (Voyager, Freedom and Oasis) have each had their exceptional size by far the largest difference-maker in their revenue and cost potential. No other variables have governed the construction of new ships in such a way. In the case of the xpTray, the four multi-purpose spaces and their ability to reduce the size of the ship are what define the financial impact compared to other ship designs. What would be the investment cost and profitability of the Freedom of the Seas vessel with these new specifications for public spaces?

Appendix 5 features the results of the calculations built upon scenario analysis with the SeaKey and TEC tools. Each scenario is the default plan with one of the multi-purpose spaces implemented. Their implementation affects the size and construction cost of the ship. Using the parameters of the SeaKey, these changes lead to other changes in e.g. interior outfitting costs and energy usage. Only the total impact on cost is reported due to the need to keep the cost structure of projects secret.

The outcomes are reported in the form of percentage differentials, individually for each multi-purpose space. Internal rate of return (IRR) and return on investment (ROI) are used because they are better for displaying changes in percentages regardless of scale than e.g. net present value (NPV). Furthermore, the interest rate in NPV would be ambiguous.

Results indicate the multi-purpose spaces to increase the investment's IRR by 9.8 percentage points. It is important to note that these multi-purpose spaces don't decrease the value of the ship, based on how their development was justified in chapters 7 and 8. As for ROI, the return is increased by a total of 3.2 percentage points. The omission of the large theater is by far most significant change; in part, it must be offset with an increase in the size of the main lounge. The solutions yield savings in

ship construction costs, interior outfitting, energy usage and port costs (which are based on ship size). Facility crew is expected to take on other duties to provide the corresponding customer value. Gross tonnage, describing the size of the vessel, is reduced from 156,000 GT to some 151,500 GT.

The potential for xpTray to create revenue is far more difficult to assess, since few objective criteria exist to measure the influence of the recommended design choices. As per Voss et al. (2008, 259), calculating the financial impact of physical environments has proven difficult in practice. Eloranta (2009) estimates that the since the narrow superstructure allows for all cabins to have a balcony, this increase in cabin quality would increase revenue from admission by 16%.

Over the length of many chapters above, this research has justified how ship design can improve the customer experience in numerous ways. Naturally, this would also result in an increase in customer value and willingness to pay. Questions still remain, especially with regards to the early stages of operation: Do passengers expect even more novel features from new ships, class after class? Can the strong points of the ship design be marketed properly? How to get customers to realize the benefits of subtle improvements? How to guarantee that service operations can indeed improve the customer experience?

It is possible that in the early stages of operation the full benefits of the design are too difficult to capture in terms of revenue. After all, it is a disruptive innovation, and such changes tend to harm value temporarily. It would take some time to overcome the challenges in operations and marketing. For these reasons, enough evidence can't be provided to claim that the xpTray could outdo the Freedom class in revenue generation. The quality of cabins is an attractive solution, but since competitive forces were deemed to dictate cruise pricing in section 6.3.2, there is no guarantee that a penetration pricing strategy wouldn't be needed for admission.

The cost savings in constructing the xpTray would be very significant. The ship design's effect on construction costs is not as unpredictable as the competitive environment of cruise operation, so those savings are likely to materialize on that scale. The uncertain situation regarding the ship's revenue potential is attributable to its nature as a disruptive innovation; few are specifically due to design choices. To conclude, any unconventional ship design would have similar challenges, and the xpTray would be the first in line to overcome them.

9 Conclusions

The study was conducted with three research question in mind, regarding business models, servicescapes and the potential value of the xpTray design. Interlinked with the different topics and frameworks in the theoretical part of the thesis, the answers to these questions are presented along with the conclusions drawn from theoretical and managerial concepts.

Sections 9.1 and 9.2 explain the reasoning behind the conclusions of this research, reviewing the state and implications of previous research in the process. The findings that are new to this research are first listed in table 9-1, complete with the extent to which they can be generalized.

Table 9-1 Key findings of the research and their applicability

Applicability	*All businesses*	*All experiential services*	*Cruise industry*
Business models	Corporate collaboration can create business models within business models, situated in the locus of change.	Traditional business typologies can't describe experiential services consistently.	Managerial cognition explains and reinforces the industry's business model of the conservative type.
Innovation	A culture of disruptive or sustaining innovation can be fostered only when such innovations are implemented.	Theory of technological innovation is superior to experiential innovation in explaining experiential services.	Experience-based cruise ship design features innovation on positioning, layout, experiential content, design themes, clues and touch points, and modularity.
Customer experience management	Expectations are an incorrect way to measure quality in experiential services. Experiences are created in touch points.	The need to manage reactions dictates that experiential services are managed with personalization. Customer experiences are dependent on SOM.	Crew operations, not cruise ship design, are the key to service personalization in the industry.
Servicescapes	A developed framework of servicescapes can be applied to design all types of services.	Service co-creation dictates that people are the crucial factor in all elements of servicescapes. Seeking economies of scale is potentially harmful to experiential value.	Both high and low utilization can degrade the quality of servicescapes.
Modularity	Different disciplines have different drivers and purposes for modularity.	A developed framework of modular architectures can be applied to design hedonic services.	Modularity facilitates utilization, design, temporal layout and cue and offering replacement.

As the research progressed from service science to business models, customer experiences and servicescapes, it became evident that the research conclusions would be detailed and diverse: No other level or scope of research would grant a holistic view on improving experiential services. Each individual observation can improve just a small part of the service: a cost-effective usage of space, availability of touch points or the content of service modules.

This chapter introduces theoretical and managerial implications of the findings separately, although the nature of business model and servicescapes research is a mixture of both. Following them, the xpTray design concept is reviewed. Lastly, the limitations of the findings and suggestions for future research conclude the thesis.

9.1 Theoretical Implications

Previous research on the topics relevant to this study is in varying stages of development. Service science and quality research have already taken significant strides in the 1980's. Although not all disciplines have reached maturity, like service operations management, academic research has developed enough methods and consensus for the purposes of this thesis.

However, the same can't be said of research on business models and customer experiences, which are more pivotal topics in this case. The best known definitions and classifications of business models have yet to achieve a particularly established status. Some of the research within the past five years still concerns the basics of business models' inner workings, such as the emphasis of cognition as a driver of business model evolution.

Current research problems in the field of customer experiences and servicescapes are more practical. Cognitive and behavioral research has only begun to classify the thought processes of potential customers. As a result, the conclusions concerning which business practices are met with which responses are limited to individual findings, and even they can be based on a rather limited questionnaire. This leaves managers unaware of which experiential content to emphasize (as in the case of the Experience Scorecard) and unable to calculate the financial impact of service experiences.

Ever since Bitner (1992) defined the basic characteristics of servicescapes and Pine and Gilmore (1998) jump-started the experience economy, scholars have found different niches and focused on the individual elements of servicescapes, such as service clues or information channels. Over the

course of this thesis, their conclusions have been compared to one another, revealing linkages such as branding or the management of responses to stimuli. In this respect, the wide variety of concepts around customer experiences and servicescapes are found to be intertwined. This indicates potential mutual causalities, which are the main evidence of the theoretical conclusions of this research. Furthermore, this describes the high level of complexity in services, including the service industry of cruise operation.

The research of the ways in which servicescapes can influence the customer experience begins from the basics of the experience economy. Research trends in the past years indicate that the discipline of customer experience management is here to stay. Despite its young age, though, it isn't evolving at a rapid pace, as breakthroughs in assessing the value of experiences remain elusive.

A common implication of customer experience elements in previous research, it is proposed that the staging of service experiences is the most dependent on operations. However, this isn't a consistent linkage in academic literature, as operations are generally mentioned only as examples; references to the discipline of service operations management are inexistent. One would hope for a convergence between CEM and SOM in the near future. A further challenge here is that researching value in services is typically left to service marketing, which complicates the field of research even more.

Business models sought to answer the question of how the attitude toward innovation in business models evolves. To run a business model where innovation isn't actively embraced in all its forms may seem counter-intuitive. Why hasn't a more differentiated product entered the market and captured a lucrative position in the blue oceans? Business model research is ripe with awe-inspiring stories of groundbreaking business models or warning cases of failure to develop them, but only in cases where the results are already known.

Whether businesses or industries should pursue a different model in the future is more difficult to justify. Forecasting profitability would be nearly impossible. Therefore, the chosen approach here is to assess whether the structures and beliefs upholding the current business model are sensible and appropriate, or if they are ill-founded and should be uprooted. How current practices come to be can be explained by business model evolution. The rest of the evidence behind the first research question is presented by managerial implications in section 9.2.

When the research attempted to define the cruise business's industry recipe, it turned out that traditional tools have trouble categorizing the cruise industry, perhaps even all experiential services.

On the most basic level, cruises are categorized as a mass service in figure 2-1 based on the high labor intensity and a level of personalization that was far lower than in definitive professional services. This typology is not an accurate description of the industry, but it is telling of the challenges that exist in managing customer experiences on large cruise ships.

The xpTray being a break from a continuous growth in ship size, it made it essential to study the design trends. At what pace is the industry changing? The results were mixed. A classic typology of defenders, analyzers and prospectors revealed elements of the cruise industry in each of them. The business net typology of customer solution nets indicated an average degree of change, whereas the industry's mantra of tradition, evolution and revolution yields yet another mixed result. Especially in the first typology it seemed that many experiential services simply couldn't afford not to be defenders, analyzers and prospectors all at the same time.

The only conceptualization able to grasp a business's attitude toward change was the divide between sustaining and disruptive innovation. In the cruise industry with immensely large and long-lived investments, the demand for sustaining innovation has encouraged gradual growth in ship size.

Despite the dawn of research on experiential innovation, the approach of technological innovation research still prevails in the case of experiential services. Innovation itself remains in a difficult position: Without the cognition and actions to accept and implement innovation, there are no reactions to innovative measures that would support and inspire further innovation. No matter how good the reasons to avoid disruptive innovation are, its absence is self-reinforcing.

Modularity is a challenging and potentially effective way across industries to manage complex projects and designs after another. The research field of modularity is particularly fragmented, with different disciplines taking completely different viewpoints to it. A comprehensive view is difficult to reach, as it is in the case of cruise ship design. Shipyards have focused on some of the most tangible applications of modularity in the construction processes, leaving the modularity of services without appropriate attention. It is reasonable to assume, though, that such limited views are common among corporations, as increasing complexity has its own challenges.

Design, marketing, engineering and logistics each have their own drivers behind modularity. Following a literature review, this research strips them down to the bare essentials to define their most important features in table 6-1. Its contribution is an understanding of why the disciplines are

so secluded from one another in modularity research – and why they sometimes deserve to be, for the sake of simplicity.

9.2 Managerial Implications

In order to use the cruise industry as an example concerning business models, the actors and their roles in the business had to be identified in figure 3-1, for which business nets proved a simple and versatile tool. However, individual cruise ships are something more than just transactions in the business models of shipyards and cruise lines: They operate over a long life-cycle as business platforms, able to be transferred from the operation of one cruise line to another. For the comprehensive nature of the cruise service, this research defined individual ships to be business models of their own, largely confined to the physical limitations and opportunities of their design. The sales/procurement process of shipyards and cruise lines explain how these new business models are created alongside the companies' respective business models. It is proposed that such new business models within corporate-level business models are created in the locus of change of the industry.

The attitude toward risk in innovation is an example of the managerial cognition which dominates business model evolution in the industry. An understanding of economies of scale prompted the construction of a larger ship class, and its success reinforced the beliefs. This cycle has been repeated for three ship classes over fifteen years in the partnership of STX Europe and Royal Caribbean International. This cognition has also had an impact on the processes of the partnership: In their sales/procurement process, the two companies have created a system of deliberate planning, a structural element of the business model fostering sustaining innovation.

The self-reinforcement of cognition has also led to undesirable consequences. It is reasonable to assume that it has played a part in maintaining unfounded assumptions, such as the perceived benefits of reducing the crew-to-passengers ratio and the necessity of maintaining the space-to-passengers ratio. New evidence behind these two issues also places the steady growth in ship size under scrutiny.

Larger ships have been constructed seeking economies of scale in terms of construction costs, energy usage and crew requirements. Economies of scale yield diminishing returns, and furthermore the adverse effects of coordination costs haven't been granted much attention. This is perhaps because the challenges of project management are difficult to quantify. Together, these two issues

indicate limits for the benefits achieved with larger ship designs. Also, it is proposed that increasing scale may hurt the ability to stage personalized experiences and the growing complexity may erode the swift and even flow of processes.

Below is the conclusion to the first research question, supported by both theoretical and managerial implications.

Research Question 1: How does the attitude toward innovation evolve in business models?

Conclusion: Business model structure alone can't explain the attitude toward innovation and change. Managerial cognition directs actions, which in turn gradually change the cognition and business model structure. Reasoning behind the decision to favor disruptive or sustaining innovation can be self-reinforcing, potentially ruling out the other approach.

Pertaining to the second research question, modularity provides context for the designs by which servicescapes can influence customer experiences. The amalgamated model in figure 6-2, developed in this thesis as a means of describing the desired modularity in cruise ship design, is a rather complex view of the issue, as it incorporates all four viewpoints of modularity reviewed in section 9.1. It is applicable for a service as intangible as cruises, but it would likely be too complex for e.g. developing high-technology products. In this case, the application of the model fulfilled the four purposes defined for modularity in cruise ship design: utilization, design, temporal layout and cue and offering replacement. Based on previous research on servicescapes, all four purposes were found to generate customer value.

Experiential services could benefit from skillfully designed operations in the creation of low-cost services. Recent years have witnessed a trend where service companies have managed to differentiate their offering by cutting back on value that isn't important to all customers, especially in the retail and transportation industries. Such examples are not yet to be found in large-scale experiential services. Even in cruises the lowest prices are offered by companies that have reduced from the key sources of experiential value, such as personal service and a stimulating cabin environment.

Many service quality issues are beyond the scope of servicescapes. Often customer dissatisfaction stems from instances where personnel haven't behaved in the intended manner. Such consistency

issues are the responsibility of quality research, which plays only a small part in this thesis despite that it can be applied to the functionality of servicescapes as well. The difficulty of using the established quality control methods in experiential services is illustrated by a problem with the Quality Gap Model. Paradoxically, it insists the service perceived to be similar to the service expected by the customer, when in experiential services the customer must be often surprised and their expectations exceeded. Again, it is to be concluded that experiential services require different research tools than traditional services.

Previous research on customer experiences, together with empirical research, has been the source of some of the most fundamental findings to support the recommendations for the xpTray design concept. As previously noted, scholars have made attempts to understand and conceptualize individual experiential services, not focused on making particularly comprehensive observations with their peers. In this thesis, four examples of such observations are proposed.

Firstly, the correct object of customer experience management is not the stimuli provided for the customer; it is the reactions and attributions that follow. Stimuli alone can lead to a variety of reactions, whereas the reactions are the actual experiences that service companies must work with. The attributions can be formed either through cognition or the affective state, although the latter appears more related to the tangible stimuli, which servicescapes focus on.

Secondly, personalization is an irreplaceable element of customer experiences. It is ambiguous whether the term is used to mean personal service or a focus on the customer's personal attributes, but nonetheless the two meanings are inseparable in experiential services. The importance of personalization stems from the first observation because only humans are accurate in identifying reactions.

Thirdly, experiential services are created in touch points. Even while servicescapes thoroughly surround customers, they are prompted to action only in touch points where there are people or objects of interest. This, in turn, leads to reactions. It is hence often better for a service to be accessible in many locations within the area (e.g. cruise ship) than to pool resources to optimize its features in one location.

Fourthly, people create the experience. Notions of service co-creation with customers are to be found in the literature of both customer experience and modular service design. As an example, on cruise ships areas lose and gain value over the course of the day depending on whether there are other passengers to spend time with.

Elements of customer experiences can be just as important elements of servicescapes as the details presented in servicescapes literature. After all, the two areas of study have converged in the last ten years. When compiling the viewpoint taken by this thesis on servicescapes in figure 5-1, the choice of underlying models is based on logic and flexibility. The underlying taxonomy and individual elements are mostly derived from managerial literature, so there is little power of proof behind them. Instead, the framework's primary goal is to be understandable. Fragmented into the research of individual elements, previous research hadn't yet featured a comprehensive listing of issues to be taken into account when managing servicescapes. As such, the framework is inherently more complex than previous listings.

Confined to the features of the physical environment, servicescapes are an apt theoretical representation of cruise ship design. Thus, it is assumed in this thesis that conclusions on servicescapes are applicable to cruise ship design as well. The framework of figure 5-1 is intended to be suitable for all servicescapes, experience-based or not. However, in the greater picture there are many service operations servicescapes don't take into account, rendering the table incomplete for assessing customer experiences as a whole. Completely different tools from operations research would be needed for that purpose.

This section is concluded by summarizing the answer to the second research question:

> ***Research Question 2: How do servicescapes influence the customer experience?***
>
> *Conclusion: Positive influence can be achieved through functional or informative elements on different levels, from strategic issues to superficial design choices. The impact of servicescapes on customer value is considerable, as it facilitates service operations, defines the possibilities for individual services and delivers the brand, among other things.*

9.3 Review of the xpTray Design Concept

The xpTray design concept is a platform for ideas, and in this research it serves as a platform for research conclusions as well. A complex environment for experiential services, it houses the multitude of recommendations derived from theoretical concepts. Hence, the case study is brought to completion by the individual pieces of innovation, which in turn provide the final justification for the relevance of the theoretical concepts used.

The types of innovation used to describe the features of the xpTray (table 7-1) were categorized using of typology of innovation in mature markets by Moore (2005) and the developed framework of servicescapes. Using these two tools, there is theoretical evidence that the listing of innovation types is comprehensive, omitting no potential improvements achievable by cruise ship design. Positioning, layout, experiential content, design themes, clues and touch points, and modularity are defined as the focal points. Best practices are identified from managerial literature and new ones are derived from observations and theses. Listing individual results of ideation under these categories illustrates that the alignment of innovation and servicescapes in table 7-1 is a descriptive framework.

Attempts to justify the choices for the service offering of the xpTray proved that there are no right answers or wrong answers regarding experiential content. The applications of the Experience Scorecard stop short of case-specific recommendations. A wide variety of experiential services flourishes around the world; some services are successful because they are versatile, others because they are focused to specific elements of the experience. On this subject, the contribution of this research was to compile the relevant criteria of evaluation from previous research: novelty, surprise, engagement, personal relevance, mutability, community, learning and dynamism. The criteria are applicable to all experiential services.

In many cases, the ideation of experiential services doesn't mean looking for groundbreaking ideas. In cruise ship design, there is the entire world's spectrum of land-based services to draw ideas from. Many of them have already been adopted by one or more cruise ship designs, and the remaining task is only to evaluate and develop them further.

The xpTray's most significant differentiating feature is the size and layout of public spaces. Having a specific amount of space has been a very standard feature in previous cruise ship design, leading to the conclusion that it has been taken for granted. The fixed ratio of passengers and space has served as a well-tested method of managing capacity by averages, but meanwhile, Soinila (interview) identifies capacity management issues as the greatest challenge of cruise service operations. It is thus questionable if the fixed ratio is an appropriate answer after all. Capacity management is addressed by the recommendations of tray design, multi-purpose facilities and scattered service areas in the case of the xpTray. Perceptions of crowding in service areas are not to be feared, as both high and low utilization rates are found to do harm to servicescapes in experience-based services.

Besides the inanimate environment, the crew plays a large part in experiential services. Previous research indicates that servicescapes can affect their behavior and operations, influencing the value of experiences through the crew. Necessary for managing reaction and attributions, the crew is an expensive resource, and no evidence is found that employee resources are currently being wasted in cruise operation. Hence, improving service personalization comes at a significant cost.

The essence of developing and optimizing the xpTray is described by the third research question: How does the xpTray conform to the needs addressed by the new, large ship designs? The extensive answer was presented in chapter 8 by the narrative test and the numbers test of the business model. The context of the evaluation is provided by a comparison to an existing cruise ship, the Freedom of the Seas.

The Freedom of the Seas design is defined in SeaKey and TEC for quantitative analysis. For qualitative analysis, it represents a conventional ship design with a wide superstructure and a large variety of modern services. A key assumption is that it is equal to the xpTray in capacity.

The recommendations made for the xpTray employ both cost leadership and differentiation strategies. In other words, the xpTray is estimated to be more economical to build and operate while providing superior value. This justifies the use of the Four Actions Framework in figure 9-2, as it is designed for the simultaneous use of the two strategies. Besides providing simply more consumer value, the xpTray has a revolutionary design that enables it to achieve a more differentiated position. It is unclear, though, whether the ship can attract passenger segments as unique as to employ a Blue Ocean Strategy.

The different multi-purpose facility combinations were found to improve the ship investment's IRR by 9.8 percentage points and ROI by 3.2 percentage points. The improvement is certainly significant for the profitability of the vessel, although it alone doesn't justify the construction of the xpTray over other alternatives. A large different between the increases of IRR and ROI are indicative of ship investments' special nature: Inexpensive capital, gathered with the support of the country of construction, softens the profit impact of the high construction cost and allows for a long wait for positive cash flow.

The decisions on multi-purpose facilities in order to save money can't be made light-heartedly, though. Especially the omission of the main theater in favor of smaller performances is a radical change. Even though the decision is supported by the principles of customer experiences, such a design choice would be inconsistent with current cruise line brands. The other combinations,

pertaining to pub activities, conference rooms and the nightclub, could be considered to be applied to more conventional ship designs as well.

A disruptive innovation, the xpTray is somewhat of a burden to the cruise line's risk management, as well as their operations. The multi-purpose spaces and scattered service areas are less straightforward to operate, requiring managers to learn new things and employees to be trained more.

The framework of innovation in cruise ship design reviews that the xpTray design provides new customer value especially in layout, design themes, and clues and touch points. However, converting the value of experiential services into revenue can't be done with sufficient accuracy. Previous research on servicescapes identifies this problem across industries, and no tool has been developed for the purpose. Hesitant customer acceptance and the challenge of managing new operations may offset the value on short term. The only predictable revenue increase is the 16% increase in cabin value. It is no small sum, though, as ticket prices bring in the majority of revenue. The exact sum can't be calculated as ticket prices include other sources of value, such as meals, in addition to cabins.

Implications of theory on pricing and choice processes indicate no necessity to offer customers an increasingly wider range of services. This allows certain lavish service facilities like the ice rink and the main theatre to be excluded from the design. Service complexity is improved with human contact in personalization, while the fear of boredom can be alleviated by marketing efforts (increasing awareness of the service offering) and further collaboration with land-based services along the itinerary.

The service assortment, along with the uncommon looks and layout, make the xpTray a marketing challenge. The novel features are now less tangible than in Freedom-class ships: Instead of ice rinks and such easily understandable concepts, value is now brought in by increased touch points and abstract measures. While the layout leaves room for rather large new features if necessary, they don't have the same compatibility with the concept and theoretical backing as the recommendations made in this research. The xpTray is designed to work with what has been found the most comfortable in land-based environments: Urban, open and unpredictable servicescapes.

On the bottom line, the xpTray can be considered to deliver equal value at a smaller cost.

Research Question 3: How does the xpTray design concept conform to the needs addressed by the new, large ship designs?

Conclusion: Conventional cruise ship designs have pursued economies of scale, a large service variety and nominal indicators such as space per passenger ratio. The xpTray seeks cost leadership and differentiation pertaining to the same challenges, using multi-purpose facilities, dynamic servicescapes and the renewal of experiences. Financial calculations indicate significant improvements in value per investment.

9.4 Limitations of the Research

This research viewed the broad subject of business models and customer experiences. In empirical research, the case study of cruise ship design proved a complex application of the theoretical framework. Product development being a comprehensive issue, the research sought answers to a multitude of questions concerning servicescapes and their value, and not all of them could be answered. The most significant limitation is the inability to calculate the financial value of servicescapes, which is a problem for all industries. Even defining or measuring the experiences themselves is primitive in academic literature. That being the case, it is no wonder that financial linkages haven't been found. This would be the single most important future step in the research of servicescapes.

The xpTray is a revolutionary design, a disruptive innovation even by its starting point, the tray layout. As theoretical evidence and ideation suggested even more new features like multi-purpose spaces, the design concepts strayed even further from its conventional counterparts. Consistent with the research on business models and managerial cognition, cruise lines have chosen not to order ship designs without enough tradition and sustaining innovation. Despite the evidence behind the value of the xpTray design, such a disruptive change can't simply be forced on the business models of cruise lines. The reluctance and risk aversion will continue to exist, and the associated operational challenges can't be ignored. It is possible that the xpTray will never be built, but at least its context will provide information on how to design other types of ships in the collaboration of shipbuilders and cruise lines.

Although the xpTray is a backlash against the growth of cruise ships, the issues behind the development don't necessarily indicate that building even larger cruise ships wouldn't be expedient. Ship designs the size of the Oasis-class, or even larger, could still turn out to be the best attractions

and capture economies of scale. The recent construction of the Oasis of the Seas is another consequence driving business model cognition; if it proves successful, it could set people's minds into continuing the trend of ever-larger ships.

9.5 Suggestions for Future Research

The xpTray, being a product of research and development at a shipyard, faces the challenge of becoming accepted by a cruise line. What would have to change for the industry to accept revolutionary ship designs? Change in business models remains a difficult topic, being complex and often highly subjective. Research on change management and the development of market orientation are examples of how to approach a related issue, but a pure business model perspective could offer a more result-centric viewpoint. What would have to happen in the organization for certain changes to be possible? What impact would these changes have on the understanding of the business model in the future?

Research of experiential services in the cruise industry should continue in the scope of cruise operation, beyond the influence of cruise ship design. Some researchers have already found the industry a fruitful ground due to its comprehensive nature. The industry could benefit from research seeking universal results and from studies identifying best practices for the industry. This research proposes new ways to put the crew in touch with passengers; more detailed information on the subject could be valuable.

Finally, customer experiences are highly dependent on context. For example, xpTray and its points of comparison are cruise ships built in Finland, yet they are mainly for operation in the Caribbean. With crew members and customers from around the world, the cruise business is a global business in need of cultural analysis. The nuances of experiential services are surely not applicable to all cultural environments. This should be taken into account both on the managerial level of service design and in grass-roots personal communication.

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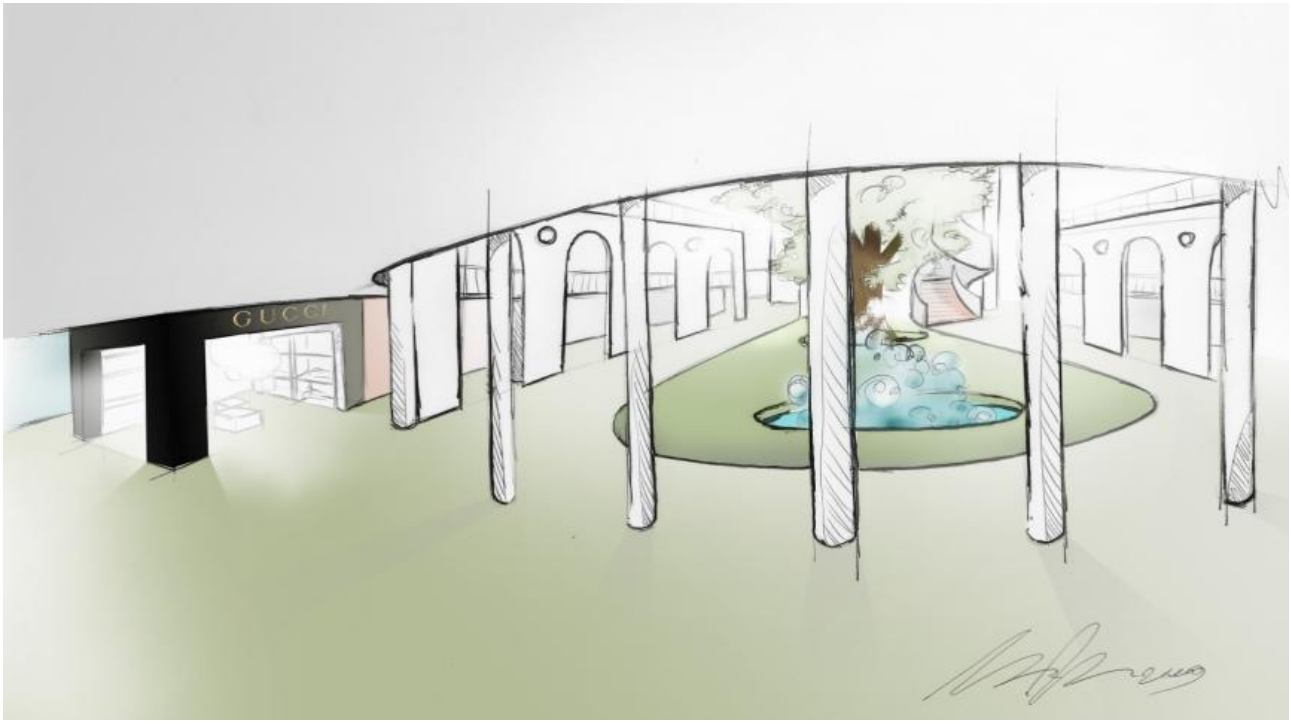
Eloranta Sauli, Vice President of Product Development and Innovation, STX Finland Cruise Oy, Turku, 23.10.2009.

Soinila Jarno, Business Administration Manager, Royal Caribbean International, Turku, 16.11.2009.

11 Appendices

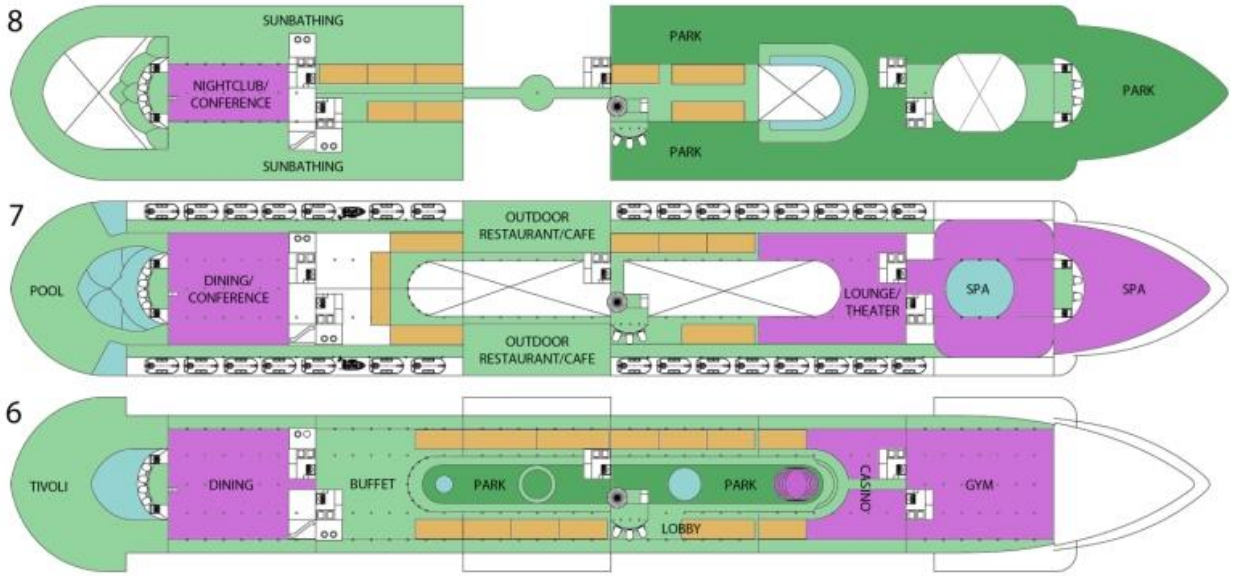
Appendix 1: Graphic Designs of the xpTray


GUCCI

Appendix 2: Facility Utilization on the Vision of the Seas

		Sunday August 9th 2009					Monday	
Deck	**Facility**	12:00	15:00	17:30	19:30	0:00	8:30	14:30
11	Viking Crown Lounge	0	0	0	0	25	0	0
10	Observatory	100	75	0	0	0	0	0
10	Adventure Ocean	0	50	0	0	0	0	0
10	Teen Center	0	0	10	0	0	0	0
10	Video Arcade	50	25	25	0	0	0	50
10	Table Tennis	100	100	25	0	0	50	100
10	Fitness Center	50	25	10	0	0	0	0
10	Rock Climbing Wall	100	100	0	0	0	0	0
10	Upper Sun Deck	100	100	0	0	0	0	0
9	Windjammer Cafe	25	75	0	25	0	100	100
9	Lower Sun Deck	100	100	10	0	0	0	0
9	Solarium	75	100	50	10	0	10	100
8	Explorer's Lounge	0	50	10	0	0	0	50
8	Crown and Anchor Study	0	75	50	0	0	0	0
7	Card Room	25	25	10	10	0	0	50
7	Kids' Room	0	50	10	0	0	0	25
7	Library	10	25	10	0	25	0	0
6	Masquerade Theater	0	10	0	0	0	0	0
6	Photo Gallery	0	0	10	50	0	0	0
6	Centrum Balcony	50	50	75	50	0	0	25
6	Showboat Lounge	0	0	10	0	0	0	10
6	Schooner Bar	10	25	25	100	0	0	0
6	Some Enchanted Evening Lounge	0	25	100	100	0	0	0
5	Casino Royal	10	10	25	25	n/a	0	0
5	Lounge	25	25	25	50	n/a	0	25
4	Aquarius Dining Room	0	0	100	100	0	0	0
4	Champagne Bar	25	25	25	85	n/a	0	10

Appendix 3: the General Arrangement of the xpTray's Public Spaces



Appendix 4: the Service Matrix for Multi-Purpose Spaces

	Amusement Park	Arcade	Bakery	Buffet	Casino	Children's zone	Cigar room	Computer terminals	Conference room	Dining room	Dock	Game room	Gym	Library	Lobby	Lounge	Night club	Park	Pool (w/ sundeck)	Pub	Retail	Rock climbing	Spa	Sports arena	Sunbathing (w/o pool)	Surf simulator	Teens' zone	Theater
Amusement Park		1				1						1			1		1		1			1		1		1	1	
Arcade	1				1	1						1	1				1		1		1						1	
Bakery				1										1	1	1		1		1	1							
Buffet			1						1							1	1											
Casino												1																
Children's zone													1				1	1	1									
Cigar room												1		1		1				1								
Computer terminals									1					1			1											1
Conference room										1							1							1				1
Dining room				1					1																			
Dock																		1	1			1			1			
Game room							1													1					1			
Gym																	1					1			1			
Library																	1			1	1		1		1			1
Lobby																		1			1							
Lounge				1																								1
Night club									1										1					1	1			
Park															1								1		1			
Pool (w/ sundeck)						1										1												
Pub			1				1					1		1							1				1			1
Retail														1	1													
Rock climbing																							1					
Spa																									1			
Sports arena																												
Sunbathing (w/o pool)													1	1						1			1					
Surf simulator	1																											
Teens' zone		1																										
Theater								1							1													

Appendix 5: Results from SeaKey and TEC Calculations

Case	Default	Outdoor party area	Closed dining spaces	Assorted pub services	Lounge with stage	Omitted theatre	**All modifications**
Gross tonnage	156000	155635	155800	155818	156230	152000	**-4517**
Total investment (index)	100	-0,21 %	-0,12 %	-0,11 %	0,14 %	-1,18 %	**-1,48 %**
Internal rate of return (index)	100	1,3 %	0,7 %	0,6 %	-0,9 %	8,0 %	**9,8 %**
Return on investment (index)	100	0,4 %	0,2 %	0,2 %	-0,3 %	2,6 %	**3,2 %**